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Proposed Woodland Expansion at Inversnaid RSPB Reserve Environmental Statement

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Non-Technical Summary

RSPB Scotland wishes to restore approximately 150 ha of native woodland on their Reserve at Inversnaid. The reserve is 817 ha made up off 183 ha of internationally designated Western Atlantic Oak woodland, 509 ha of moorland and woodland and 125 ha of rough grazing. The reserve lies on the eastern banks of Loch Lomond, north of Inversnaid Hotel.

This Environmental Statement outlines the results of the Environmental Impact Assessment process required by Forestry Commission Scotland because the project could have significant impacts on the environment. It provides detailed information about the site, outlines the project being proposed and assesses the impacts it could have on a number of aspects of the area and identifies any mitigation that is required to reduce these impacts.

The principal establishment technique to be used to create new native woodland will be deer fencing and planting approximately 100 ha and allowing natural regeneration over an area of about 50 ha. The deer fence is proposed to join with the Forestry Commission's fence which is already consented for around Loch Arklet. There will be no planting on deep peat and other priority open ground habitats will be sensitively designed into the woodland.

This project forms an integral part of The Great Trossachs Forest's (TGTF) vision of restoring, protecting and enhancing native habitats including high canopy oak woodland, Caledonian pine, wood pasture, wet alder woods, open moorlands, montane, wetlands and grassland across 16,600 ha. This is a unique partnership project where RSPB Scotland, Forestry Commission Scotland and Woodland Trust Scotland all own adjacent landholdings and are working in partnership to achieve the same vision.

The regeneration of native broadleaf and conifer woodland is one of the central aims of the Local Woodland and Forestry Framework. More specifically, the project will contribute to the Framework's aims to link existing woodland in Forest Habitat Networks across the National Park.

There is a degree of uncertainty surrounding what impact the deer fencing will have on the red deer population movements and welfare. In particular, the possibility that deer will move westwards and be funnelled into the Pollochro Woods SSSI and Craig Royston Woods SSSI (both components of Loch Lomond Woods SAC), with the result of increasing the deer browsing impacts on their designated features has been considered. In addition, the cumulative impact of existing, consented and proposed deer fences on deer numbers, densities, welfare and seasonal movement within the TGTF area have been assessed. The socio-economic impacts of erecting the deer fence and associated supplementary cull of deer on the adjacent estates has also been assessed. The local communities' other concerns about increasing deer pressure on properties, road safety and viewing deer have been considered.

From survey information recently collected, deer are at sustainable levels on the reserve but goat numbers are excessively high. With the help of modelling, deer movements in the area were predicted as a result of the RSPB and FCS fences being erected. It is predicted deer are likely to move into the Pollochro Woods SSSI (they can't get into Craig Royston Woods SSSI because these are already deer fenced). Monitoring of potential impacts that this may cause will be put in place and action will be taken to adjust cull targets accordingly. This

information will be detailed in a Herbivore Management Plan. The potential for compensatory culls being required as a result of the fencing have been discussed with the TGTF partners and a strategic deer management plan has been produced to identify how the partners will work together over the issue of deer. The proposals were also presented to members of the Balquhidder Deer Management Group (DMG), who were content that the necessary measures that may need to be taken to protect the SSSI and SAC, would not cause any socio-economic impact to the adjoining Estates. As it is difficult to predict movements of deer in the future both on Inversnaid and in the wider area, it is therefore difficult to predict what the cumulative impact of erecting deer fences could be and the potential for knock-on natural heritage and deer management impacts elsewhere. This issue can be addressed by ongoing collaboration with TGTF partners and the DMG.

A Landscape Assessment for the project was carried out according to Forest and Landscape: UK Forestry Standard (UKFS) Guidelines by a landscape architect because the project area fell within the Loch Lomond National Scenic Area. A number of viewpoints were selected in discussion with NPA, SNH and the local community. The results of this work concluded that the project would have minor or moderate impacts on the landscape depending on which viewpoint the project is viewed from. The deer fence would only be temporary and removed after 15 to 20 years once the woodland is established. Overall, the landscape and visual assessment's conclusion is that the proposed deer fence is not visually obtrusive in general.

The project will not significantly affect the golden eagles in the area as it is outwith their core ranges. Black grouse are a priority species for RSPB Scotland and new fencing will be located and marked to minimise the risk of collisions. It is anticipated the new woodland will improve the habitat for black grouse on the reserve. There will be some loss of moorland breeding birds but the new woodland in time will create ideal habitat for a range of priority woodland species associated with upland woodlands.

West of Scotland Archaeology Service identified eight sites that appear to lie wholly or partially within the area likely to be affected by proposed planting. They identified some general recommendations for their management and protection for these features. These along with the Forestry Commission's "Forests and Archaeology Guidelines" will be followed to ensure no damage is caused to these features as a result of the project.

Grazing livestock will be maintained on the site, maintaining agricultural income and employment.

RSPB are considering building a small visitor centre/office in the Garrison car park. The interpretation on site will be improved and new technologies used to enhance the visitor experience. More people will be encouraged to visit the Reserve. The project will not restrict access to the reserve and with a series of self-closing gates in the deer fence people will continue to be able to explore the hills beyond. In the long term, as a result of the woodland proposals, improved visitor facilities and access to Inversnaid, additional staff resource may be required to carry out land management, monitoring, wardening and visitor engagement roles.

Every precaution will be taken to protect the private water supply that comes from the burn and its tributaries by the sheepfank. Legal responsibilities will be met, best practice guidance will be followed and contingency planning put in place, which should significantly reduce the potential for negative impacts on the water supply to residents and visitors that use this water.

Having assessed the impacts of the project on many environmental factors, it can be concluded that, with mitigation, it would not have any significant environmental impacts and overall it is likely to have a positive effect on the environment.

Schedule of Changes

In response to comments received during the consultation process changes have been made to the ES document in the following sections:

Type of change	**Page**	**Chapter**	**Section**
Insertion of text	12	2. Site Description	2.6 Hydrology
Insertion of text	21, 24, 25	3. Description of Proposals	3.2 Details of the proposal
Insertion of table	21-23	3. Description of Proposals	3.2 Details of the proposal
Removal and replacement of photograph	24	3. Description of Proposals	3.2 Details of the proposal
Insertion of new photograph	25	3. Description of Proposals	3.2 Details of the proposal
Addition to text	52	4. Prediction of impacts	4.6 Hydrology
Figure 15 inserted		Figures	
Figure 16 inserted		Figures	

The inserted text is highlighted by being in a different font from the original text, the same as this sentence. The images will have black borders.

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1. Introduction

This project to create approximately 150 ha of new native woodland at Inversnaid RSPB Scotland Nature Reserve was screened under the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 by Forestry Commission Scotland to determine whether it "is likely to have significant effects on the environment by virtue, inter alia, if its nature, size or location". An Environmental Impact Assessment (EIA) screening meeting was held on Tuesday 17 January when a range of consultees were asked what they considered to be the potential impacts of this project. A minute of the EIA screening meeting can be found in Appendix I. The conclusion from this process was that consent for this project is required under the above regulations and an EIA should be carried out.

The main reasons for this decision were that the scale and nature of the proposed work is likely to have a significant effect on:

Deer - The use of fencing to excluding deer from certain areas may cause changes in distribution and movement across their natural range. Where this is likely to have a subsequent impact on the management objectives of neighbouring properties, possible consequences of changing numbers and densities of deer need to be considered, particularly with respect to impacts on natural heritage interests.

Landscape - The area lies within the Loch Lomond and the Trossachs National Park and the Loch Lomond National Scenic area. The introduction of woodland via planting will have an immediate impact on the landscape, particularly as a result of cultivation and fencing.

Secondary reasons are:

Natural Heritage –

Golden eagles - An assessment of the impact of the proposals on golden eagles in the area needs to be made, as per the joint FC/RSPB Research Information Note No 292 Golden Eagles and Forestry.

Black grouse – A risk assessment should be carried out on the possible impacts on the population

Other Bird Interest -The effect on the proposals on the existing bird population must be taken into account, together with an analysis of how the population may change if woodland is established.

Otters - The proposals could have significant effects on the local population of otter, a European Protected Species through changes in riparian habitat and patterns of disturbance.

Vegetation – there is potential for loss of priority open ground habitats.

Archaeology - The location of any archaeology and its setting will have to be carefully recorded and considered when drawing up the detailed planting proposals.

Social and Economic Impact -The impact of the proposals on local employment associated with the current farming enterprise and the social infrastructure of the area must be considered.

Visitor and Public Access - The impact of the proposals on the use of the area by members of the public needs to be assessed and proposals to improve the visitor management infrastructure, if appropriate, described.

Acidification - The location of the proposed new woodland falls within a critical load exceedance square. The requirement for undertaking a catchment-based critical load assessment needs to be determined through discussion with Forestry Commission staff.

The impacts of the woodland creation on all of these aspects will be considered in Chapter 4 of this document.

Forestry Commission Scotland permitted the EIA Screening meeting to also act as a scoping meeting, as consultees would be the same. A draft scoping report was produced identifying the range of issues and their importance raised by the consultees. This was distributed for further consultation to those who were not able to attend the meeting. No other major issues were raised other than those already identified above. The final scoping report can be found in Appendix I, which includes a list of consultees and their individual responses.

2. Site Description

2.1 Location

The project area is on the RSPB Scotland Inversnaid nature reserve (Figures 1& 2.) situated on the eastern slopes of Loch Lomond just north of Inversnaid at 56°15' North and 04°40' West, National OS grid reference NN348108 (OS 1:10 000 maps NN31sw, NN31se, NN30nw & NN30ne). To the north of the reserve boundary is Glen Falloch Estate, to the south and east is Forestry Commission's Loch Katrine Estate, there are also pockets of land to west and south owned by Lochs and Glens who also own the Inversnaid Hotel.

2.2 Geology

The solid geology of the site is covered by the British Geological Survey Argyll sheet 56N 06W at a scale of 1:250 000. It shows the site to be underlain by metamorphic grits (Ben Ledi Grits) of the Upper Dalradian Southern Highland Group which in turn belong to the Dalradian supergroup. There are also intrusions of intermediate coarse-grained, acid fine - grained and basic fine-grained igneous rocks (Figure 3).

2.3 Soils

Poorly drained blanket peats, peaty podzols, peaty gleys and some peaty rankers cover the majority of the site. The existing woodlands along the shore are based on brown rankers, brown forest soils and humus-iron podzols. The soils belong to the Strichen association that covers some 37% of central Scotland. The intrusion of basic rock on the slopes of Beinn a' Choin in the north of the site gives rise to moderate base enrichment of the soils in this area. The soil overall is generally very acidic being derived from Dalradian schists, although there are base rich flushes at a few sites and these areas support the more interesting plant communities.

2.4 Elevation, Aspect & Topography

The project area is mainly on south-westerly and south–easterly aspects (see Figure 4), with an altitudinal range of 130 to 400 metres. The terrain is particularly rugged, with the south western part of the proposed planting area having some fairly steep slopes. In the north it flattens out slightly by comparison. There are numerous rocky crags, outcrops and river gullies throughout the area.

2.5 Climate

The climate of the Loch Lomond catchment can be described as mild and wet due to Atlantic depressions and cyclonic frontal systems combined with local rapid uplift caused by convection. The northern catchment has a 30-year average annual rainfall of 2,500 millimetres with a maximum of 3,600 millimetres on the slopes of Ben Ime above Loch Sloy. There is evidence of a significant increase in rainfall over the last 20 years, particularly in the winter months (Loch Lomond Catchment Management Plan, SEPA, 2003).

2.6 Hydrology

The proposed area for woodland expansion lies within the catchment of Loch Lomond, which, at 36 kilometres long, 71 square kilometres in area and with a mean depth of 37 metres, is the largest area of fresh water in Great Britain (Loch Lomond Catchment Management Plan, SEPA, 2001).

There are two main rivers flowing in a southerly direction: The Snaid Burn and The Pollochro Burn. The Pollchoro Burn flows directly into Loch Lomond while the Snaid Burn joins the Arklet Water in Glen Arklet before emptying into Loch Lomond. There are numerous tributaries, such as the Allt Trosdain, flowing in a south to south westerly direction into the Snaid Burn from the high ground in the east. Figure 5 shows the direction of water flowing from the site.

There are two private water supply intakes at NN350 098 and NN 347 105, the catchment of the former is outwith the proposed planting area and therefore will not be affected by the planting. The catchment area for the burn of the other intake (by the sheepfank) will be within the planting zone. Part of the catchment of a third private supply for the Inversnaid Photography Centre lies within the regeneration area.

2.7 Landscape

The RSPB Scotland Inversnaid nature reserve takes in a swathe of land from the east shore of Loch Lomond at its western edge to the broadly convex summits of Beinn a' Choin (770m) and Stob an Fhàinne (655m) at its eastern edge. The saddle of Bealach a' Mheim links these two tops.

The land rises steeply from the loch shore to a broadly even height ridge line marked by Creag an Fhithich (348m) before falling into the broad valley of the Snaid Burn and its network of tributary streams and then rising again to Beinn a' Choin and Stob an Fhàinne.

The west facing slopes above Loch Lomond have an open covering of native woodland interspersed with areas of bracken and silvery grey rock outcrops. The native woodland contains Sessile Oak (*Quercus petraea*) with Silver Birch (*Betula pendula*) along with areas of Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*) and Wych Elm (*Ulmus glabra*). Rowan (*Sorbus aucuparia*), Hazel (*Corylus avellana*), Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*) are common in the understorey. Variation in the species mix and vegetation patterns in the open ground give rise to subtle variations in both summer and winter colour, whilst rock outcrops show grey against the summer shades of green and winter shades of brown and russet. The Loch Lomond shore woodland on the face of the west facing ridge is a remnant of a larger wood which would have extended into the Snaid Burn valley and onto the slopes of Beinn a' Choin and Stob an Fhàinne before clearance for grazing, which has since prevented natural regeneration except for amongst inaccessible crags and close to steep burn sides. This project proposes to re-establish woodland through both planting and natural regeneration.

2.8 Designations

The reserve is within the Loch Lomond & The Trossachs National Park (LL&TTNP) and within the Loch Lomond National Scenic Area (NSA) as shown in Figure 6.

The woodland on the west facing slopes of the reserve is part of the Pollochro Woods Site of Special Scientific Interest (SSSI), which forms part of the Loch Lomond Woods Special Area of Conservation (SAC). The SSSI was designated in 1989 and covers 294 ha of which 183 ha are on the Reserve, the rest lies within Glen Falloch Estate to the North as shown in Figure 7. These woods are listed as being of ancient origin.

A new feature of 'wood pasture and parkland' has recently been added to the SSSI designation. This feature will be fully assessed in the next round of Site Condition Monitoring (SCM). However, it is assumed that the condition is the same as the wet woodland feature (unfavourable, declining) as it is another woodland feature. Up until 2011 it was assumed that the SSSI was in favourable condition, particularly on the basis that the 2008 SCM identified the wet woodland feature as being in favourable condition. The 2008 SCM concluded that targets for regeneration and browsing levels were met. This assessment was substantially revised in February 2012 following a visit by the SNH woodland specialist. The conclusions of this visit was that Pollochro Woods are overgrazed, that this overgrazing is limiting the regeneration of palatable species, and restricting the species composition of the woodland both in the field and canopy layers.

Feature	Condition (year of assessment)
Western acidic oak woodland (SAC)	Unfavourable declining (2002)
Wet woodland (SSSI)	Unfavourable, declining (2012)
Lichen assemblage (SSSI)	Favourable, declining (2010)
Bryophyte assemblage (SSSI)	Favourable, maintained (2009)
Wood pasture and parkland (SSSI)	To be assessed

Table 1: The designated habitat features of the SAC and SSSI and their condition.

2.9 Vegetation

Highland Ecology carried out a National Vegetation Classification (NVC) survey in 2003 over the entire area of the reserve, east of the Snaid Burn. RPS were commissioned to carry out a NVC survey in 2012 to update and supplement this survey, as it did not cover all of the current proposed woodland creation area.

In total 15 different communities are found within the 570 ha survey area, which can be further separated into 32 sub-communities. The communities range from typical acid upland communities including mire, wet and dry heath and acid grasslands, to woodland and flush communities surrounding watercourses and on the free draining soils of the steeper slopes.

The majority of the site comprises previously grazed acid grassland, particularly the higher ground to the east e.g. the steep slopes of Stob an Fhàinne up to 630m. Much of this is composed of damp and heathy *Nardus stricta* grassland, mossy and more typical *Festuca ovina-Agrostis capillaris* (U4) grassland and peaty *Juncus squarrosus*(U6) grassland. The more steeply sloping hillsides contain the U20 *Pteridium aquilinum – Galium saxatile* community; easily recognisable by the dominant presence of bracken (*Pteridium aquilinum).*

The principal blanket bog area is M17a *Trichophorum cespitosum - Eriophorum vaginatum* blanket mire, *Drosera rotundifolia - Sphagnum sp.* sub-community with much smaller examples of the M17c *Juncus squarrosus - Rhytidiadelphus loreus* sub-community. M17a is

concentrated on the less steeply sloping ground overlooking the Snaid Burn in the north-west of the site but also occurs as isolated fragments within other communities.

Poor fen and acid flush is a major component of the site. M6 *Carex echinata-Sphagnum fallax/denticulatum* mire typically covering the intermediate slopes in the centre of the site. This is a soligenous mire type marking out areas of seepage with mildly acidic waters on poorly drained peaty soils.

Dry heath is not a major element of the vegetation. It occupies the steepest, rockiest knolls and crags towards the northern edge of the site only. It exists in a mosaic with heathy forms of acid grassland where remnant heath clings to crags inaccessible to previous sheep grazing and acid grassland covers the less precarious slopes.

Upland oak/birch with blaeberry woodland (W17 *Quercus petraea – Betula pubescens – Dicranum majus* woodland) is present as natural regeneration surrounding a number of burns draining the hillside in the west and also dominates the hillside in the east of the site over looking Loch Lomond. The woodland is dominated by a canopy of sessile oak (Quercus petraea) and downy birch (Betula pubescens), with occasional stands of holly (Ilex aquifolium) and alder (Sorbus aucuparia). The ground cover contains a mixture of heath species such as ling heather or blaeberry, with abundant feather mosses present throughout.

2.10 Fauna

2.10.1 Birds

The bird species that might be impacted by the woodland proposal were determined by reference to Annex 1 of the Birds Directive, Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), UK Biodiversity Action Plan (UKBAP) priorities and Red and Amber listed Birds of Conservation Concern. These are termed priority or sensitive species.

Golden eagles are Annex 1, Schedule 1, UKBAP and Amber listed species. Golden eagles are occasionally seen foraging over the reserve with sightings occurring most often over Stob an Fhainne. The ridge running north to south from Creag an Fhithich is also used. Observations for both areas have been mainly recorded in late summer, autumn and winter. The Central Scotland Raptor Study Group confirmed there three golden eagle territories, two are active and one is currently inactive in the vicinity of the project area. The core areas of all of these are outwith the project area. The irregularity of sightings of golden eagles over Inversnaid, suggests it is not their main foraging area.

Other Annex 1 species recorded occasionally on the reserve are hen harriers, short-eared owls and peregrines perhaps once or twice a year. None have been known to breed on the reserve.

There are two or three locations where black grouse lek on the reserve, all on the inbye fields (see Figure 8). Black grouse leks are monitored annually and RSPB holds records going back to the early eighties. The proposed planting area has been checked for leks over the past few years but no birds have been recorded lekking in this area. The total number of lekking males seen this spring was four. This is a decrease on 2011 numbers, when there were eight lekking males split over the two leks. Brood counts are also undertaken in the summer time,

no chicks were recorded last year but six blackcock and three greyhens were noted at various locations on the inbye and moorland.

RSPB Scotland carry out an upland breeding bird survey over a one kilometre square (NN3410) once every five years, this square covers part of the project area. In 2011, within the project area, Red and Amber listed species recorded were: meadow pipit, cuckoo, skylark, willow warbler, this accords with the 2012 survey results.

An assessment of the impacts of the proposals on golden eagles and black grouse was requested as part of the EIA, as well as a moorland breeding bird survey to determine the effect the proposals will have on the bird populations.

2.10.2 Mammals

Eight species of mammal have been recorded on the woodland creation area, they are as follows:

- Red deer
- Roe deer
- Feral goat
- Weasel
- Red fox
- Short-tailed vole
- Brown long-eared bat
- Pipistrelle bat

Red deer are present on the site in varying numbers across the year and a stalker is contracted to meet the cull targets set to keep numbers at a sustainable level. RSPB Scotland is an active member of the Balquhidder Deer Management Group with the reserve warden being the vice chair of the group. At these meetings deer culls are discussed and targets agreed. Currently the cull targets are set at 8 stags, 35 hinds and 5 calves. In March 2012 a helicopter count over the reserve was undertaken and 10 stags, 8 hinds and 5 calves were recorded. Also on this count 54 feral goats and 16 trespassing sheep were recorded. In addition to this count, a thermal imaging survey of the woodland area was carried out by SNH in April 2012, which recorded 90 goats in total within the Pollochro Woods SSSI, of which 69 were on Inversnaid RSPB Scotland nature reserve. There are currently no cull targets set for the feral goats. There is a cull target of 5 roe deer on the reserve; however, none were sighted during the 2011-2012 season.

Otters have never been seen on the reserve nor have any signs of otter been recorded. An otter survey was carried out as part of the EIA but no signs were found. Badgers are present in the woodland but have not been seen out on the open moorland.

2.10.3 Other species recorded

Other species previously recorded within the project area are as follows:

- Dragonflies
    - Golden ringed

- Amphibians
  - Common lizard
  - Common frog
  - Common toad

- Butterflies
  - Orange tip
  - Peacock
  - Scotch argus
  - Small tortoiseshell
  - Large white
  - Small white
  - Red admiral
  - Small pearl-bordered fritillary
  - Green veined white
  - Small heath

2.11 Historic and Current Landuse

The RSPB Inversnaid nature reserve is made up off two landholdings. The Inversnaid Estate was purchased in 1986 (land to the west of the Snaid Burn) and in September 2002 Garrison Farm (the land to the east of the Snaid Burn) was purchased. The Inversnaid Estate was a mixture of woodland and sheep grazing. Following the purchase sheep were removed and deer controlled to reduce grazing pressure, with the aim of restoring woodland. Historically, it is likely woodland would have covered much of the project area. Bloomery mounds are found on the site, which is the accumulated waste of iron ore smelting. This process required large amounts of charcoal and therefore the furnaces are usually associated with woodlands. Over time the woodland would have been cleared for agricultural purposes and grazing levels would have increased from livestock and deer in the glen. As a result, the extent of the woodland has gradually decreased and was probably at its lowest area ever in the late eighties.

In the past two centuries the primary landuse on Garrison Farm has been sheep farming. Following the purchase of Garrison Farm by RSPB Scotland, 1092 black faced sheep were replaced with 40 Shetland sheep and 35 Highland cattle with followers, a total of between 90 and 100 at any one time. Sheep numbers since this time have been reduced. The cattle only have access across the southern part of the reserve as shown in Figure 9. Beyond the sheepfank there is no grazing other than by red deer and feral goats. Deer stalking takes place throughout the reserve. In 1998, 25 ha of Scots pine was planted on the original Inversnaid reserve, this area will be incorporated into the proposed woodland creation area.

2.12 Access and Recreation

There are four promoted access routes on or through the reserve. The busiest and best known of these is the West Highland Way, which runs along the shoreline of Loch Lomond and receives approximately 50,000 visitors a year. The Woodland Trail is a 600 m loop path off the West Highland Way, which takes visitors to the higher slopes of Pollochro Woodland and provides stunning views of Loch Lomond. This trail attracts approximately 4000 visitors

a year. From the recently created car park at the Garrison, which has an information board, bicycle racks and seating areas, there is a trail that follows the hill track and leads to the restored sheep fank further up the glen. The Old Military Road path (due to be completed later in 2012) follows most of the Old Military Road route from Stronaclachar to the Garrison car park. From here it will eventually link into a new path on Forestry Commission's land, south of the Inversnaid road to Rob Roy's Car Park and follow a trail down to Inversnaid Hotel. These new paths will form part of 'The Great Path', a Great Trossachs Forest initiative, which will allow people to walk or cycle off road, from north of Callander all the way to Inversnaid.

We are not aware of any known walking routes through the site to the hills beyond, except one being mentioned in a walking book, which follows the march fence with FCS Loch Katrine Estate.

2.13 Cultural Heritage

An archaelogical survey was conducted by CFA Archaeology Ltd in 2003, who were commissioned by the RSPB following their purchase of Garrison Farm. The area surveyed at that time extended to the whole reserve and immediate areas. A total of thirty-four sites were identified. Off these, eight appear to lie wholly or partially within the area likely to be affected by proposed planting. These are made up off collapsed shielings, a group of bloomery mounds, a sheepfold, and other boundary features.

2.14 People and the Community

There is a small but active community at Inversnaid. This is comprised of eleven private houses, one holiday home, one self-catering holiday let, one bunkhouse, one B&B and one hotel, all within a mile of the reserve. Inversnaid falls under Strathard Community Council Area.

Tourism and recreation is a key feature of Inversnaid, with visitors staying at the Inversnaid Hotel, Inversnaid Lodge and the Snaid Bunkhouse. There is also a photographic centre that runs workshops.

2.15 Local Woodland and Forestry Framework

The Loch Lomond and The Trossachs National Park have a Local Woodland and Forestry Framework, published in 2003. Inversnaid RSPB reserve falls within Loch Lomond Central & North Action Area (No. 5) for which a set of recommendations has been devised. In summary, these are:

- Conserving and enhancing the landscape along Loch Lomond.
- Improvement of the condition of native woodlands through positive management.
- Improve habitat condition for capercaillie.
- Further expansion of native woodland through establishing new woods and restructuring existing woodlands.
- Linking fragmented or isolated areas of native woodland.
- History of woodland management will be reflected through interpretation provided to visitors.
- Increase in access to woodland and forests.
- Forestry operation will seek to minimise impacts on West Highland Way.

- A woodland management strategy should be developed for road and rail corridors along Loch Lomondside.

The proposal for woodland expansion at Inversnaid aims to contribute towards the first seven of these recommendations in a positive way and is thus in the 'preferred' category for afforestation. As for the eighth and ninth recommendations, all forestry operations will take place at some distance from any rail links, the project area cannot be viewed from the West Highland Way and major road corridors are well screened so the proposal also conforms to these recommendations.

3. Description of Proposals

3.1 Introduction

In 1998 the RSPB received funding under a Woodland Grant Scheme to plant 25 ha of native woodland on the original RSPB Inversnaid nature reserve. This area was deer fenced and marked and after 14 years has developed well. The fenceline is regularly walked to search for any collisions by black grouse and identify any maintenance issues. To date no black grouse collisions have been recorded.

The RSPB purchased the 440 ha Garrison Farm as an extension to the Inversnaid nature reserve in September 2002 because it provided excellent opportunities to both increase the area of native woodland and to link up the remnants of the original forest cover that is still found in the area. Previously the Garrison had been managed as a sheep farm, which for a number of years had become increasingly uneconomic to maintain.

No feasible conservation alternatives were identified as being suitable for the site, partly due to the degraded nature of many of the habitats. However, the site suited RSPB Scotland's primary goal of creating and expanding native woodland in the Loch Lomond area, and accords well with the Local Forestry Framework (see 2.15). Non conservation alternatives e.g. commercial forestry, sporting and wind farm, were not considered appropriate.

To this end, in 2003 RSPB Scotland embarked on creating new native woodland on the Garrison Farm part of the reserve. 250 ha of open ground were identified as having the potential for new native woodland and scrub over the next 200 years. Using a combination of tree planting and natural regeneration, it was proposed that a mosaic of scattered woodland and open ground, will be created across the site without the use of deer fencing. An Environmental Statement was written in 2005 by Central Environmental Surveys, which was subsequently approved by Forestry Commission Scotland (FCS). This allowed RSPB to successfully draw down Scottish Forestry Grant Scheme funding to promote native woodland expansion through natural regeneration without deer fencing for a period of five years. The success of this scheme was to be reviewed after this period. The review took place in 2010 and it concluded that native woodland expansion by natural regeneration had not been successful because of the impacts from browsing. RSPB repaid the grant to FCS.

In 2005, FCS were successful in leasing Scottish Water's Loch Katrine Estate. Forestry Commission also had a vision to create native woodland on the lower slopes of the Estate. This was the beginnings of The Great Trossachs Forest (TGTF); a partnership project between RSPB Scotland, Forestry Commission Scotland and Woodland Trust Scotland (WTS). On the eastern end of the Loch Katrine Estate, WTS were also attempting to restore native woodland on their Glen Finglas Estate. This project forms an integral part of The Great Trossachs Forest's (TGTF) vision of restoring, protecting and enhancing native habitats including high canopy oak woodland, Caledonian pine, wood pasture, wet alder woods, open moorlands, montane, wetlands and grassland across 16,600 ha.

RSPB Scotland would still like to restore native woodland, but this time across a slightly different area of Inversnaid Reserve, with the use of temporary deer fences. The area identified for planting is on the middle part of the reserve and the natural regeneration area is adjacent to the internationally recognised Loch Lomond oakwoods. It is proposed that

approximately 100 ha will be planted and natural regeneration will be allowed to occur on approximately another 50 ha. Both areas will be temporarily fenced to overcome the previous issue of browsing.

The current area of cattle grazing on the reserve is 125 ha. An enclosure on the lower slopes of Stob an Fhàinne will be created (33.5 ha) (see Figure 10), using the top line of the deer fence as a boundary. A small enclosure (2.5 ha) will also be created using livestock fencing to the south and west of the sheepfank. Grazing by cattle is seen as an important management tool to benefit black grouse. However, other important bird species such as snipe, curlew, twite, skylark and reed bunting will also benefit from this grazing regime. The area outwith the deer fence will be maintained as open ground or as existing woodland. Browsing in these areas will be a key issue and there will be an ongoing need to monitor the vegetation and manage deer and goats to ensure the habitats found in these areas such as wet flushes, montane vegetation and woodland and their associated biodiversity can thrive.

Inversnaid is categorised within the RSPB Scotland nature reserve network as a quiet enjoyment site and is marketed accordingly. In recent years a car park has been created behind the Garrison Farmhouse. An information board is located in the car park, along with seating and bicycle racks. Visitors are encouraged to walk up the glen to the sheep fank along the existing 800m track; this is known as the upland trail. The sheep fank is a 6'-high drystane-walled structure, traditionally used to segregate sheep for dipping and shearing. It is one of only a few surviving fanks in the area and has recently been restored as a visitor attraction. Further seating and information is provided at the sheep fank, where formal access to the site terminates. From there on, visitors to the area are welcome to make their own way up the glen if they wish to proceed further. There are a number of argocat routes created by the stalker and these are what most people are likely to follow if they continue up the Glen. Where these pass through the proposed fenceline a self-closing gate will be installed to maintain access for reserve management purposes and to allow the public to continue to access the hills beyond.

All RSPB Scotland nature reserves have a five year management plan, the current Inversnaid Management Plan runs from April 2009 to March 2014. It was widely consulted upon at the time of preparation and approved by SNH. Each plan contains information about the site, an evaluation and rationale for the management, vision and management objectives and a five year work programme. This project will help deliver several of the management objectives identified in the management plan. Additional monitoring of the project area will occur in subsequent management plans to record changes to flora and fauna over time. This will help inform whether the objectives for the project are being met.

All woodland management operations will follow the latest Forestry Commission Guidelines, particularly Forests and Water, Forests and Historic Environment, Forests and Soil, Forests and Landscape and Forests and People. Likewise, all work will be carried out in accordance with UKWAS standards and will conform to the UK Forestry Standard.

The objectives for the project can be summarised as follows:

- Expand through natural regeneration existing native woodland at Inversnaid
- Restore native woodland within the reserve

- Recreate and safeguard important habitats for black grouse
- Promote opportunities for public access
- Contribute to our understanding of woodland habitats and the species that depend on them

3.2 Details of the proposal

The proposals are to exclude deer from an area to allow planting of native woodland species on about 100ha of moorland and allowing trees to regenerate over part of another 50ha. This will be achieved by erecting 5250m of new deer fence, upgrading 1008m of stock fence to deer fence height. The deer fences will be marked to reduce risk of collisions by black grouse, as will the removal of 1425m of redundant deer fence of an existing exclosure. There will be six self closing gates in the new fenceline to maintain access to the wider hill ground and three ladder styles at strategic points to aid site management. 467m of new stock fences will be erected to enable cattle grazing in areas that currently they are excluded from. This will improve the management of the open habitats.

3.2.1 Fencing

A review of the previous attempt to restore woodland on the reserve concluded that browsing by deer, goats and trespassing sheep was preventing any tree regeneration. Evidence for this is that all saplings in this area are no greater in height than that of the surrounding vegetation and all shoots appear to be browsed. The previous attempt to restore the woodland was combined with a more concerted effort of deer control on the reserve. However, due to sporadic deer movements across the northern boundary of the reserve, it was impossible to reduce their numbers or affect their behaviour sufficiently to ensure natural regeneration and establishment of the planted trees took place.

FCS has a general policy of only supporting the use of deer fencing when no reasonable alternative is appropriate (FCS Guidance Note 11). Having tested the alternatives to deer fencing on this site and at others, RSPB are seeking to establish woodland expansion by erecting deer fencing for 15 to 20 years to protect the planted trees and encourage natural regeneration. See figure 2.

RSPB considered several different options for fencing, please see the table below and Figures 11, 15 and 16 that illustrate these. The pros and cons for each option are listed and this helped inform our options appraisal process.

Option	Pros	Cons	Recommendation
1. Fencing directly around planting **Figure 15**	• Large area of tree establishment: c. 120 ha fenced • Allows continued herbivore access to current woodland without compromising plantings • Favourable with Deer Management Group • The deer would still have access to lower ground via	• Water-gate across Snaid Burn on downstream section will be a weak point to deer, which will lead to ongoing expense for maintenance and/or replacements • Montane scrub establishment unlikely, as no land outside planted area is enclosed	**Not recommended**

	several routes	• Roe incursion less likely to be picked up • Could see more deer down in the grazed area of the reserve competing with livestock • Deer wouldn't be able to move further south as the Loch Arklet FCS fence would be a barrier • FCS boundary fence would come close to black grouse leks and possibly go through a regular flightline. • Some risk of bird strikes associated with the fence across southern section of planting.	
2. Linking with FCS. **Figure 11**	• Larger area of tree establishment than above option - 150ha plus another 50ha along ridge for regeneration, total area enclosed c. 200ha • All fences would be well away from lekking black grouse. FCS wouldn't need to fence the march line to the south which may conflict with black grouse leks • Wouldn't need to deer fence the southern edge of the core planting area, thereby reducing strikes risk from the likely regular flightlines of black grouse flying in and out of the new woodland • Allows continued herbivore access to current woodland without compromising plantings • No need for a water-gate on the downstream section of Snaid Burn • Strengthen partnership working in within TGTF • Deer grid on the road outside houses would not be needed and could be moved further down the road away from houses	• May meet DMG opposition • A closed corridor could funnel deer from the north allowing a build up of animals within the SSSI. • Roe incursion less likely to be picked up • Reliant on fences outwith RSPB control and FES will want to ensure our fences are in good order • Longer fence and therefore slightly more expensive but larger area enclosed. • Greater change to the landscape, because of fenceline.	**Recommended**

	• Negate the need for FCS to run a deer fence along the southern edge of the road to protect their Loch Arklet South planting • Fencing along top edge would provide an extension to grazing area • Would allow natural regeneration from SSSI to come over hill and help with habitat networks		
3. Alternative link with FCS fence Figure 16	• Short section • Better hidden in landscape • excludes grazing from Stob an Fhainne so additional 82ha enclosed and may result in some montane scrub • Greatly reduced strike risk	• Greater cost for work because more difficult location • Higher altitude and snow cover could allow deer to cross the fence more easily • Much greater maintenance and checking burden	**Not recommended**
4. Fence through SSSI **Figure 16**	• Shortest route • Would allow regeneration in the corridor between the existing woodland and the plantation • Additional 145ha enclosed	• Drop to loch very difficult to fence • Excludes grazing from large area of SSSI, could result in loss of key bird species and conflict with designated features • Negative impact on deer welfare by excluding from woodland cover • Second deer fence will be required (not shown) to prevent animals moving north through woodland and becoming trapped within our woodland • Fencing may be required across neighbours land • Fence across WHW twice • Increased stalking burden in woodland, • The goat population would have to be removed from within the fenced area.	**Not recommended**
5. Alternative fence through SSSI Figure 16	Similar to option 4 but less of the woodland would be excluded from fenced area.	Same as option 4	**Not recommended**

The final decision was between option 1 and option 2, fencing directly around the proposed planting area or linking with the FCS. The alternative options were eliminated because of their potential negative impacts on the SSSI or impracticality. Having thoroughly considered the positives and negatives of these top two options, we concluded that the proposed fenceline within the ES had many more positives than fencing around the planting (option 1). Following discussion with members of the Deer Management Group and SNH, it was concluded that many of the negative aspects of Option 2 could be managed and/ or mitigated for. This strengthened our view that it was the preferred option. Therefore, the proposed fenceline links in with FCS' Loch Arklet deer fencing (see Figure 11). The fence would link to the existing march fenceline and at the bridge across the Arklet Water leading to Rob Roy Car Park. A deer grid will be located on the public road by the bridge leading to the Rob Roy carpark.

Forestry Commission Scotland is leading on the installation of the deer grid, as this was previously approved through the EIA for their proposals on Loch Katrine estate. Initially, this grid was going to be placed in the road next to the boundary of RSPB and FCS land. However, this was going to be near houses on the other side of the road, which the community didn't look favourably on. The RSPB's proposal of linking into the FCS fence, enabled the deer grid to be moved to the proposed position. This alternative offers several benefits in that it is away from any houses and cannot be viewed from any residences and the road is already wide enough at this location to put in a gate to the side.

The grid will be made to a standard highway grid specification with a jump width of 15ft 3ins (as in photo above) and it will be manfactured to fit the road it is going on. It will have a wooden pedestrian gate (similar to photo below) designed with best practice in mind on the side nearest the bridge

leading to the Rob Roy car park, which will allow walkers, cyclists and horse riders to pass safely. The sides of the grid are likely to be constructed of wood as in the picture above, but to deer fence height. There is no fixed design for deer grids and adjacent fencing, therefore both FCS and RSPB shall liaise with the National Park's Landscape and Access Officers to ensure that best practice is met and that impacts on landscape are minimised. It was felt that creating a visualisation of the grid would not add to this description because the surrounding fencing can be designed to whatever specification that is required to minimise visual impact.

Much of the management on the open ground of the reserve is targeted to increasing numbers of black grouse. The woodland will benefit black grouse as it will provide food sources, nesting areas and shelter. However, it is known that black grouse can fly into inappropriately sited deer fences resulting in a negative impact on their population. Therefore, the fences will be sited as far as possible from black grouse leks and the sections at risk from collisions will be marked to increase their visibility to the birds.

In conclusion, the fenceline has been chosen after considering various options because it provides the greatest number of benefits to land management, conservation interests, adjacent landowners and the local community, these are as follows:

- It would negate the need to deer fence the lower march line with FCS, which may conflict with regular flights of black grouse between leks.
- It would negate the need to deer fence across the southern edge of the proposed planting area and therefore remove the possibility of collisions by black grouse, which are likely to be flying up into the new woodland area.
- By not just fencing around the planting area, the proposed fenceline would allow natural regeneration to occur next to Pollochro Woods SSSI and therefore extend this woodland.
- It would prevent the need to have FCS' Loch Arklet South Fence running along the public road to meet the Loch Arklet North Fence, which was of concern to the local community.
- It would prevent the need for a grid on the public road outside the houses at NN355095, with the resulting noise of vehicles crossing; this would instead be located at the bridge to the Rob Roy carpark.

- Allows continued herbivore access to the SSSI woodland without compromising new woodland, as some grazing is required in the woodland in order to maintain other priority interests (such as the lichen assemblage and woodland bird assemblage).

However, we acknowledge the fencing may have potentially negative impacts on deer movements and the landscape. The following chapters will detail these impacts, assess them and describe any mitigation proposals that are required to reduce any negative impacts.

3.2.2 Woodland Types and Proposed Woodland Composition

In natural woodlands, tree species are not distributed randomly, but tend to occur in associations or communities based on climatic zone, geology and soil conditions. Rodwell and Patterson (1994) suggest that the NVC can constitute a valuable working tool for the design and management of new native woodlands, by providing lists of the most ecologically appropriate species to plant, and enabling predictions to be made concerning the kind of woodland that might be expected to develop naturally on a site.

The NVC analysis will be used to guide the planting design. Table 2 shows the expected successional relationship between the NVC communities recorded at Inversnaid and potential woodland types. This indicates the likely woodland communities resulting from natural regeneration.

NVC communities	Habitat/soils	Successional relationships
U4 *Festuca ovina - Agrostis capillaris - Galium saxatile* grassland	well-drained base-poor mineral soils	W17 *Quercus petraea - Betula pubescens - Dicranum majus* (especially on (e)). W11 *Quercus petraea - Betula pubescens – Oxalis acetosella* on better soils; also W18/W19
U5 *Nardus stricta - Galium saxatile* grassland	moist peaty mineral soils, base-poor, infertile	W17, W4 *Betula pubescens - Molinia caerulea*. W18 *Pinus sylvestris - Hylocomium splendens* on better soils. Problems with tree establishment owing to peaty mat layer and dense-litter choked herbage; also W11, W19
U6 *Juncus squarrosus - Festuca ovina* grassland	moist peats, peaty mineral soils, base-poor, infertile	On drier soils through heath to W4, W17
U20 *Pteridium aquilinum - Galium saxatile* grassland	well-drained base-poor mineral soils	W17 *Quercus petraea - Betula pubescens - Dicranum majus* (especially on (e)). W11 *Quercus petraea - Betula pubescens – Oxalis acetosella* on better soils; also W18/W19
H10 *Calluna vulgaris - Erica cinerea* heath	dry, free-draining soils	W17 on the poorer soils, W11 on better soils. Possibly W19, W18 at higher altitudes with downy birch the dominant canopy tree

H12 *Calluna vulgaris - Vaccinium myrtillus* heath	free-draining mineral soils	As H10
M6 *Carex echinata - Sphagnum recurvum*/auriculatum mire	peat, peaty gleys, base-poor	W1 *Salix cinerea - Galium palustre* woodland, W4
M15 *Scirpus caespitosa - Eriophorum vaginatum* blanket mire	peat and peaty mineral soils	W4, W11, W17, W18; also W7
M17 *Scirpus caespitosa - Eriophorum vaginatum* blanket mire	waterlogged peat	M15, wet heath; also W4, W18
M19 *Calluna vulgaris - Eriophorum vaginatum* blanket mire	waterlogged peat	W4, W18
M20 *Eriophorum vaginatum* blanket mire	waterlogged peat	W4, W18
M23 *Juncus effusus/acutiflorus - Galium palustre* rush pasture	moist acid to neutral peaty and mineral soils	W1, W4, also W7
M25 *Molinia caerulea-Potentilla erecta* mire	moist but well-aerated acid to neutral peats/peaty mineral soils	W4; also W7

Table 2: Habitat characteristics and successional relationships of NVC types recorded at Inversnaid (adapted from Rodwell 1991 et seq)

The following table outlines the suggested target NVC communities for planted woodland at Inversnaid according to Rodwell and Patterson (1994). This has been used to inform the planting plan.

NVC code	Woodland name	Associated soil types	Major recommended tree species*	Minor recommended tree species*	Recommended shrubs
W4	Birch with purple moor grass	Acid peats, peaty surface-water gleys and base-rich groundwater	Downy birch	Alder, goat willow	Grey sallow, eared willow, bay willow

		gleys			
W11	Upland oak-birch with bluebell	Acidic brown earths and podzolic brown earths	Downy birch, sessile oak	Holly, rowan, aspen, silver birch, pedunculate oak	Hawthorn, hazel, juniper
W17	Upland oak-birch with blaeberry	Rankers, podzolic brown earths and podzols	Downy birch, sessile oak	Holly, rowan, silver birch, pedunculate oak	Hawthorn, hazel, juniper
W18	Scots Pine with heather	Pozols, peaty podzols, podzolic gleys	Scots Pine	Downy birch, silver birch, rowan	Juniper

Table 3: Composition of woodland NVC types appropriate to Inversnaid, according to Rodwell and Patterson (1994)

The hypothetical composition of planted woodland envisaged at Inversnaid is:

W4 *Betula pubescens - Molinia caerulea* woodland

- Birch (dominant) 50%
- Alder (poor second) 25%
- Rowan (some) 7%
- Willow (sometimes) (*S. caprea, S. pentandra, S. aurita*) 7 %
- Oak (infrequent) 5%
- Hazel, hawthorn, holly (very occasional) 6%

W11 *Quercus petraea – Betula pubescens – Oxalis acetosella* woodland

- Birch/oak (dominant) 65%
- Ash (scarce) 5%
- Rowan (occasional) 10%
- Holly (occasional) 5%
- Hazel (occasional) 5%
- Hawthorn (scarce) 5%
- Juniper (in open spaces) 5%

W17 *Quercus petraea – Betula pubescens – Dicranum majus* woodland

- Oak/birch (dominant) 65%
- Rowan (scattered) 5%
- Holly (uncommon) 5%
- Ash (very occasional) 5%
- Hazel (important) 10%
- Hawthorn (very occasional) 5%

- Willow (*S. caprea*) (a little) 5%

W18 *Pinus sylvestris – Hylocomium splendens* woodland

- Scots pine dominant (open woodland) 55%
- Birch (commonest companion) 20%
- Rowan (occasional) 5%
- Oak (lower altitudes) 5%
- Holly (occasional) 5%
- Juniper (scattered bushes) 5%
- Alder, aspen, willow (occasional) 5%

Although the boundaries of the NVC communities have been used as a basis for the establishment plan, there is not complete concordance between NVC categories and habitat specification. Boundaries must therefore be interpreted flexibly and the boundaries between different woodland communities will therefore be diffuse rather than sharp. Practical site-related considerations will also be important in the establishment plant.

The areas to be planted cover a variety of habitats e.g. U5 and U4 acid grassland, M6 acid flush, M15 wet heath and U20 bracken communities. No planting will take place on deep peat. Some planting areas will be close to areas of M17 and M19 blanket bog, which is a priority habitat, and planting should generally not take place in the vicinity of this community.

3.2.3 Planting structure

The tree planting density in the machine cultivated areas will be up to 2500 trees per hectare, with a reduced density everywhere else. On average over the entire planting area there will be 1600 stems per hectare. Spacing will be varied and will reflect the geomorphologic features of the site, thus rocky outcrops and boggy areas will be avoided. The edges of the planting groups will have a reduced density of trees to make them more appealing to black grouse for longer. At the same time some dense thickets will be created. Planting material will be locally sourced to maintain the genetic integrity of the woodland and to comply with Forestry Commission guidelines.

3.2.4 Ground Preparation

Ground preparation may include continuous mounding, scarifying or ploughing on gentle slopes. The latter method would have the necessary buffer zones left along water courses to prevent any direct discharge entering them. Where it is not possible or permitted to use these methods, for example on steeper slopes or inaccessible areas to machinery, these areas will be hand-screefed.

3.2.5 Vegetation Control and Weeding

The mechanical ground preparation process will create a vegetation-free zone for trees to be planted on for the first few seasons. However, the trees that have been planted on hand screefs may require weeding in the first few seasons. Following an assessment of need, chemical weed control will be carried out around planted trees in accordance with product labels. In those areas where chemicals are not permitted, then hand cutting of vegetation around saplings will be carried out.

3.2.6 Fertiliser Requirements

The RSPB aims to minimise the use of fertilisers on its landholdings. It is not anticipated fertilisers will be required. However, there may be some instances where fertiliser application may be useful, where there is clear evidence that any planted trees are showing signs of mineral deficiency. Fertiliser would then only be applied by hand.

3.2.7 Protection from Browsing

As discussed earlier (3.2.1) a deer fence will be erected to prevent browsing by deer and goats. Should any deer or goats be seen within the exclosure then they will be humanely dispatched at the earliest opportunity.

If a major deer incursion occurs into the fenced area, then this will be classed as an emergency situation. RSPB in partnership with Forestry Commission, shall follow their approved protocol, this can be found in Appendix III. This follows a process of assessing the situation; it is then communicated to neighbours and the Chair of the Deer Management Group (DMG). The options for dealing with the situation are discussed, from this, the situation will be resolved and finally the process will be reviewed to identify if any lessons can be learnt, these will be discussed with the DMG.

Trees will be vole- guarded where necessary, for example, where they are being planted in grassy areas or the tree species are particularly vulnerable to vole damage.

3.3 Natural Regeneration

From the various walk over surveys, seedlings are present but are currently not able to get above vegetation height because of the levels of browsing. Within and next to the woodland creation area there are existing trees, which will provide a seed source for further natural regeneration. The majority of these trees are birch, rowan, willow and hawthorn.

Natural regeneration is a slow process, particularly on the impoverished and exposed ground. It is not possible to give precise timescales for this process but within existing exclosures in the woodland and the one created in 1998 on the moorland area; do help inform the potential growth rates that may be seen in this area. Within the woodland exclosures, regeneration is strong and diverse and includes ash, oak, holly and honeysuckle and in the exclosure created in 1998 with only Scots pine planted, there is good levels of birch and rowan regeneration. Therefore, it is likely to be at least 10 years before there are any obvious results on the ground.

3.4 Recreation and Access

As part of The Great Trossachs Forest project, RSPB are considering building a small visitor centre/office in the car park, which will have Wifi and from there online interpretation of the three partner sites can be downloaded. For example, a virtual history trail may be developed to be used to interpret the historical features that can be viewed from walking along the Upland Trail to the sheep fank. There is also an ambition to create a 'picture frame' at the sheep fank, which visitors will be encouraged to take pictures through, of the developing woodland and download them onto the TGTF website. This will create a photographic record from season to season from the same point showing how the trees are developing over the years and how the area is slowly changing back to woodland.

4. Prediction of Impacts and Mitigation

The following section assesses the potential impacts of the proposals at RSPB Scotland Inversnaid nature reserve on various aspects of the natural and cultural heritage, raised at the screening meeting and subsequent scoping process. Design and management features intended to mitigate adverse effects are considered.

4.1 Deer

Management of deer on site is crucial to achieve certain objectives for the site, such as having semi-natural woodland in good condition, achieving woodland expansion, making sure priority open ground habitats thrive and helping montane species to establish and flourish. However, the evidence that has been collected with regard to these site objectives show the reserve to be under performing in all these aspects. The main reason for this can be attributed to deer and goat browsing and grazing.

RSPB Scotland are addressing these issues in a number of ways. A Long Term Forest Plan has recently been commissioned to help with woodland management within the Pollochro Woods SSSI. In addition, there is now a commitment to write a Herbivore Management Plan for the whole Reserve, liaise more closely with neighbours and become more involved in the local Deer Management Group (DMG). The commitment to actively create woodland is the subject of this Environmental Statement.

4.1.1 Potential Impacts

The screening and scoping stages revealed a degree of uncertainty surrounding the impact the deer fencing will have on the red deer population movements and welfare. In particular, a potential risk was identified that deer would move westwards and be funnelled into the Pollochro Woods SSSI and Craig Royston Woods SSSI (both components of Loch Lomond Woods SAC), with the result of increasing the deer browsing impacts on their designated features.

In addition, the cumulative impacts of existing, consented and proposed deer fences within TGTF area on deer numbers, densities, welfare and seasonal movement within the wider Balquhidder DMG area was also identified as requiring consideration.

The socio-economic impact of any deer reduction cull on neighbouring management objectives, implemented as a result of the fencing, also requires to be assessed.

The local community were concerned that deer would be funnelled into resident's gardens on the southern boundary of the Pollochro Woods and into the grounds of the Inversnaid Hotel, causing damage and increasing health and safety risks to passengers in vehicles.

4.1.2 Baseline information and survey results

In March 2012 a helicopter count over the reserve was undertaken to determine the red deer population on the reserve. The results of this survey revealed there were 10 stags, 8 hinds and 5 calves. Also during this survey 54 feral goats and 16 trespassing sheep were recorded. In addition to this count a thermal imaging survey of the woodland area was carried out by SNH in April 2012. They recorded a maximum count of 90 goats within the Pollochro Woods SSSI, of which 69 were on Inversnaid RSPB Scotland nature reserve. Whilst it is recognised that any population count can only represent a snap-shot in time and that deer

densities will be subject to fluctuations according to weather, season etc, the SSSI area is likely to represent a home range for goats. The helicopter count also indicated that the feral goat population occurs predominantly outwith the proposed fencing. This observation is supported by the reserve staff as they rarely see goats away from the woodland on the higher ground to the east of the reserve. No roe deer were sighted during the 2011-2012 season on the reserve and are not thought to be of concern.

SNH have assessed the existing wet woodland feature of the Pollochro Woods SSSI to currently be in unfavourable declining condition. The condition assessment indicated that browsing impacts are too great to allow healthy levels of natural tree regeneration. This conclusion is supported by the deer and goat counts carried out in March this year. The helicopter count identified a deer density of 2.5 km^2 across the whole of the Glenfalloch East and Inversnaid. The current population estimation of goats equates to a density of 23 per km^2 to 29 per km^2 actually on the SSSI. The recorded deer density figure is within a range where natural regeneration is expected to occur (below 6 deer per km^2). It is therefore possible to conclude that the current herbivore impacts are largely attributable to goats.

SNH, in conjunction with RSPB Scotland and Glen Falloch Estate, have undertaken a baseline survey of the current level of browsing within the SSSI woodland habitats. The methodology that was used to establish this baseline level of browsing was based on the Woodland Grazing Toolkit devised by the Forestry Commission and SNH. The conclusions of this work highlights the woodland in places has an open structure with clear potential for regeneration, but with very little recent regeneration maturing into established trees. The current herbivore impacts recorded on seedlings, saplings and the field layer indicates that browsing is highly likely to be the main factor contributing to the scarcity of regeneration, with goats as the principal browsing herbivore and red deer as a secondary influence. There is significant potential for regeneration as evidenced by the large number of seedlings recorded in plots.

Through the scoping process the woodland agents that are responsible for the Craig Royston Woodlands to the south of Inversnaid Hotel, confirmed that this area is already deer fenced and therefore no deer would be able to enter this woodland from Pollochro Woods and increase the browsing impact. Therefore, the assessment of deer impacts below will only refer to Pollochro Woods.

At a request from SNH, The Hutton Institute have carried out some deer modelling in this area to help predict how deer will respond to the RSPB Scotland fence around Inversnaid Reserve and it in combination with the FCS fence around Loch Arklet. The model predicted that as a result of the cumulative effect of fencing in the wider TGTF area there was a potential risk of more deer moving into Pollochro Woods. Images of the model outputs can be found in Appendix II.

4.1.3 Assessment and mitigation of impacts

From the information that has been collected, it indicates that current deer levels are well within sustainable levels and they are not likely to be causing the impacts on the SSSI. However, according to The Hutton Institute's deer modelling predictions, deer are likely to move into Pollochro Woods as a result of the cumulative deer fencing impact. The models were based on count data available at the time (2010 count data) however, the most recent

count data (2012) indicated that localised densities of deer on a neighbouring property within the TGTF area were double that used in the models. This would suggest an increased risk of deer movement into Pollochro Woods over and above that predicted by the models. Predicting how deer will respond to significant changes in their landscape is not an exact science and some uncertainty will remain however, actions to mitigate against this potential increased risk will be covered in the strategic Deer Management Plan (DMP) produced by TGTF partners (RSPB Scotland, FCS and WTS).

It is crucial that monitoring continues in order to identify changes in browsing levels and help to adjust and plan cull targets accordingly to reduce undesirably high browsing impacts on woodland regeneration. Dung counts will take place over the winter this year to help to inform herbivore densities and differentiate between deer and goat pressure. The browsing levels survey will be repeated 12 months after the last one, according to the Woodland Grazing Toolkit methodology. The information will be used to assess whether the level of herbivore management across the Inversnaid reserve is sufficient to allow regeneration of the woodland. If it is not then cull targets will be adjusted accordingly for both deer and goats.

Following this initial monitoring, it is proposed that the Woodland Grazing Toolkit method to assess herbivore impacts will be undertaken at 3 yearly intervals. Dung transects will also be used to contribute information to assess changes in herbivore density and utilisation at 3 yearly intervals and annual helicopter counts will be undertaken in conjunction with SNH/FCS.

A Herbivore Management Plan for the whole reserve will be written by December 2012. The primary aim of this plan will be to correct the balance between the current browsing and regeneration levels that being seen in the Pollochro Woods. The plan will address both deer and goat numbers; cull targets will be set initially based on the recent survey work results mentioned above, which indicates a significant goat cull will be required. The plan will contain a detailed monitoring timetable and associated methodologies to assess browsing impacts over time and to indicate the different browsing pressures applied by deer and goats. Monitoring will also be established to include the moorland area beyond the fence. This information will inform RSPB, SNH and neighbours if there are changes in deer distribution, which may cause increased pressure from deer moving into Pollochro Woods as a result of the deer fences. Future cull targets will be adjusted accordingly in consultation with the TGTF partners and the Balquhidder Deer Management Group to ensure any significant impacts on designated features of the SSSI or priority open ground habitats are avoided.

The cumulative impact of existing, consented and proposed deer fences on deer numbers, densities, welfare and seasonal movement within TGTF area are considered in a new strategic Deer Management Plan (DMP) produced by TGTF partners (RSPB Scotland, FCS and WTS). TGTF DMP also presents actions for the management of deer within TGTF, establishes how the deer population and the potential impacts will be monitored, and what action will be taken to manage deer impacts if they are detected. As well as internal and external communication processes surrounding all the aspects mentioned. A copy of the TGTF DMP can be found in Appendix II.

The most important avenue for discussing cull targets and their impacts is within the Balquhidder Deer Management Group (BDMG). The TGTF partners are all members of the BDMG and attend its bi-annual meetings. The Group is in the process of producing a DMP for the Balquhidder area. The Estates in the south of the area, namely the TGTF partners, generally have different objectives to those in the north, which consider themselves as more traditional stalking Estates. The BDMG DMP has not yet been finalised, but it is expected that these differences will be recognised.

The socio-economic impacts of a potential supplementary cull on neighbouring management objectives was discussed at length at a special subgroup meeting of the BDMG with representatives from neighbouring estates in March 2012. Most income comes from stalking stags during the season and as there are very few stags found on Inversnaid (relative to elsewhere in the DMG area) attendees agreed that any increase in culls would not pose a problem. Collectively, the attendees at this meeting concluded the fencing proposal and any increase in cull targets that this may mean, would be unlikely to have a significant immediate socio-economic impact on their Estate's interests.

As discussed above, although there is potential for some movement of deer to increase into Pollochro Woods but provided the necessary mitigating and monitoring actions are undertaken there should be no change in pressure from deer on local residents' properties or within the hotel grounds.

By linking with the FCS fence, the need for them to fence along the road to protect their Loch Arklet South planting is removed. It also removes the risk of deer coming down onto the public road and having nowhere to go, with resulting health and safety benefits to road users.

In conclusion, there is an immediate need to significantly control goats on Inversnaid to move the SSSI and SAC towards achieving good condition, whilst maintaining deer numbers at the current low levels. Monitoring will continue to be carried out to inform changes in browsing and regeneration levels from deer and goats. This should also highlight if changes in deer distribution is occurring as a result of the deer fences. The information collected from this work will help inform setting future cull targets and the impacts this may have on neighbouring estates and the wider Balquhidder DMG area would be discussed and agreed in collaboration with the members of the DMG. Although it is very difficult to predict deer movements in the future, in the short to medium term mechanisms have been agreed to help manage deer to ensure impacts on the natural heritage features or deer welfare will not occur as a result of erecting the deer fences. Therefore, it is unlikely there will be a significant impact as a result of this proposal. In the long term the project will have a positive impact on the deer population once the deer fences are removed because there will be better habitat for them than currently exists.

4.2 Landscape

4.2.1 Potential Impacts

The erection of a deer fence and proposed woodland can potentially have both a visual impact on those who will have a view of the structure, and an impact on the character of the

local landscape. The proposed fenceline is located in one of Scotland's most highly sensitive landscapes, recognised through the National Park and National Scenic Area designations, with high visitor appeal. Other principal visual receptors include settlements, residential properties, key transport routes and recreational routes.

4.2.2 Assessment and mitigation of impacts

Forest and Landscape: UK Forestry Standard (UKFS) Guidelines request that all proposals for change need to be considered throughout the area from which they will be visible and the impacts on the nature of views assessed. This is typically done from a range of representative viewpoints. *The Guidelines for Landscape and Visual Impact Assessment (GLVIA), Second Edition* (Landscape Institute and lEMA, 2002) guidelines have been followed, which are the industry standard and cover the landscape assessment requirements of UKFS.

A landscape architect from RPS was contracted to carry out the landscape assessment on behalf of RSPB Scotland. The assessment of landscape and visual effects is informed by seven viewpoints, which were agreed with the Loch Lomond & The Trossachs National Park landscape architect. After undertaking the field survey the initial viewpoint from 'along the minor road' was replaced by the viewpoint which was taken from the minor road adjacent to the Bistro. The decision to exclude the viewpoint 'along the road' was due to the visual barrier which is created by the existing vegetation and fence. See Figure 11 for the locations of the seven viewpoints.

The full landscape assessment report and associated images can be found in Appendix III.

Viewpoint 1: Inveruglas Picnic Site

Figure Number: 2
Viewpoint Location: The viewpoint is located in the Picnic area of Inveruglas Visitor Centre. The view is aligned in an easterly direction. The viewpoint is situated 1.4 km to the west of the site/deer fence at an elevation of 8 m AOD.
Existing View: The view looks over Loch Lomond to the ridge of Creag an Fhithich/Sroin Uaidh which rises above the opposite shore of Loch Lomond. The peaks of Stob an Fhainne and Beinn a Choin are seen rising above Creag an Fhithich/Sroin Uaidh, forming the skyline.
Description of Effect: The wireline shows some sections of the fence running along the landform of Creag an Fhithich/Sroin Uaidh. The fencline follows the shape of the landform. **Cumulative effect with FCS Fence:** The wireline shows the proposed FCS fence running along the landform of Cruachan.
Importance of view: High due to the large number of visitors**.**
Landscape Sensitivity: High due to national level designations.
Magnitude: Negligible Due to the distance it would be difficult to distinguish the proposed deer fence within the wider landscape. The same applies to the proposed FCS fence. The proposed planting within Inversnaid Glen would be screened by the landform of Creag an Fhithich.
Mitigation of landscape effect: Due to the negligible effect, no mitigation is required from this viewpoint.

Significance of Visual Effects: Minor – not significant

Viewpoint 2: Track behind Sloy Power Station

Figure Number: 3

Viewpoint Location:

The viewpoint is located on the track on the landform of Coire nan Each which rises above the western shore of Loch Lomond. Sloy Power Station is located on the bottom of its foothill. The view is aligned in an easterly direction. The viewpoint is situated 2.2 km to the west of the deer fence at an elevation of 272 m AOD.

Existing View:

The view looks over Loch Lomond, Stob an Fhainne and Beinn a Choin forming the direct skyline. Lock Arklet is noticeable above the landform of Sroin Uaidh. Cruachan and the other hills which rise to the south of Loch Arklet form the skyline in the right side of the view.

Description of Effect:

The wireline shows the entire layout of the proposed fence although Inversnaid Glen remains screened by the landform of Creag an Fhithich//Sroin Uaidh. The proposed planting appears on the western foothill of Stob an Fhainne and Beinn a Choin.

Cumulative effect with FCS Fence:

The wireline shows the proposed FCS fence running along the landform of Cruachan.

Importance of view: Medium

View is experienced by walkers and by the workers at Sloy Power Station.

Landscape Sensitivity: High due to national level designations.

Magnitude and duration: Negligible

Due to the distance it would be difficult to distinguish the proposed fence within the wider landscape. The same applies to the proposed FCS fence. The proposed planting would become visible above the landform of Creag an Fhithich. It would be seen as a natural extension of the existing vegetation which presently covers the landform.

Mitigation of landscape effect:

Due to the negligible effect, no mitigation is required from this viewpoint.

Significance of Visual Effects: Minor – not significant

Viewpoint 3: View above the Rob Roy Car Park

Figure Number: 4

Viewpoint Location:

The viewpoint is located at Rob Roy Pointed View Point on the foothill of Cruachan, above the Arklet Water. The view is aligned in a northerly direction. The viewpoint is situated 200 m to the south of the deer fence at an elevation of 142 m AOD.

Existing View:

The rocky landform of Sroin Uaidh is in direct view. In the left side of the view the peaks of Little Hills form the skyline and in the right side of the view Stob an Fhainne and Beinn a Choin form the skyline. The view is enclosed due to the surrounding vegetation.

Description of Effect:

The wireline shows several sections of the proposed fence running on the landform of Sroin Uaidh and on the foothills of Stob an Fhainne and Beinn a Choin, above Inversnaid Glen. The proposed woodland is shown by the wireline spreading within Inversnaid Glen.

Cumulative effect with FCS Fence:

The wireline shows a close section of the proposed FCS fence on the foothill of Cruachan.

Importance of view: High due to the large numbers of visitors.

Landscape Sensitivity: High due to national level designations.

Magnitude and duration: Low

The closest fenceline which runs at a distance of 200 to 600 m on the landform of Sroin Uaidh would be screened by the existing vegetation. Further sections at a distance of 600 m to 1.2 km would be partially noticeable within the landscape. Due to the rocky outcrops of Sroin Uaidh in between the fence runs, the fence would not be seen against the skyline, but on the backdrop of the landform.
The proposed fence running on the foothills of Stob an Fhainne and Beinn a Choin would be difficult to distinguish due to the distance (beyond 1.5 km).
The proposed planting would not become visible from this viewpoint.
Due to the short section of the fence which would become visible the magnitude of the change is considered to be low.

Mitigation of landscape effect:

Due to the low effect, no mitigation is required from this viewpoint.

Significance of Visual Effects: Moderate – not significant

Viewpoint 4: On Minor road in Glen Arklet

Figure Number: 5a and 5b

Viewpoint Location:

The viewpoint is located on the minor road which runs parallel with Arklet Water, within Glen Arklet. View No 1 is aligned in a westerly direction and view No 2 to the north-east. View No 1 is situated 200 m to the east of the deer fence at an elevation of 118 m AOD. View No 2 is situated 1.3 km to the south-west of the deer fence.

Existing View:

The view No 1: In the foreground the existing fence lines the road and the gate can be seen. The view is enclosed by roadside vegetation. It is obvious that, due to the gate, the vegetation is trimmed to allow access to the field. Beyond the fence the grounds rise towards the landform of Sroin Uaidh.
The view No 2: The view is enclosed by roadside vegetation. Through the vegetation the outlines of the landforms of Stob an Fhainne and Beinn a Choin are perceivable.

Description of Effect:

View No 1: The proposed fence and woodland do not appear on the wireline.

View No 2: The wireline shows the fenceline on the foothills of Stob an Fhainne and Beinn a Choin above Inversnaid Glen.

Cumulative effect with the proposed FCS Fence:

View No 2: The wireline shows a short section of the FCS fence running along the landform of Stob an Fhainne

Importance of view: Medium

View is experienced by walkers/travellers on the road. The section of the road between Inversnaid and Loch Lomond is lined by dense vegetation.

Landscape Sensitivity: High due to national level designations.

Magnitude and duration: Negligible

View No 1: No effects would occur due to the screening provided by the landform.
View No 2: Due to the distance and the existing vegetation the proposed fence line would not be visible. The same applies to the proposed FCS fence. The proposed planting would be screened from view by the roadside embankment and by the existing roadside vegetation.

Mitigation of landscape effect:

Due to the low/negligible effect, no mitigation is required from this viewpoint.

Significance of Visual Effects: Minor – not significant

Viewpoint 5: The Garrison Car Park

Figure Number: 6a and 6b

Viewpoint Location:

The viewpoint is located in the RSPB Inversnaid Nature Reserve Car Park. This is the starting point of the Nature Trail. View No 1 is aligned in a south-westerly direction. The viewpoint is situated 660 m to the north-east of the deer fence at an elevation of 132 m AOD. View No 2 is aligned in a north-easterly direction. The viewpoint is situated 840 m to the south-west of the deer fence.

Existing View:

The view No1: The landform of Creag an Fhithichis forms the short distance skyline above Inversnaid Glen. The high peaks of Arrochar Alps rise above the landform of Sroin Uaidh, forming the long distance skyline.

The view No 2: The landmass of Stob an Fhainne rises at a short distance, forming the skyline. A fence can be seen in the foreground and a fence is also distinguishable along the landform of Stob an Fhainne at a distance of 440 m. The existing fence provides a good example of predicting the potential visibility of the proposed fence (double the height of the existing one) within the landscape.

Description of Effect:

View No1: The wireline shows some sections of the proposed fence on the landform of Sroin Uaidh, following the contours of the landform. The proposed woodland does not appear on the wireline.

View No 2: The wireline show three short sections of the proposed fence on the foothill of Stob an Fhainne. Some parts of the proposed planting are shown above the landform.

Cumulative effect with FCS Fence:

View No1: The wireline shows a short section of the proposed FCS fence on the foothill of Cruachan.

View No 2: The wireline shows a short section of the proposed FCS fence on Stob an Fhainne.

Importance of view: High due to the large number of visitors

Landscape Sensitivity: High due to national level designations.

Magnitude and duration: Low

View No1: Due to the rocky outcrops of Sroin Uaidh in between the fence runs, the fence would not be seen against the skyline but on the backdrop of the landform. Some short sections of the proposed fence at a distance of 660m would not appear as visually disruptive features. The section of the proposed FCS fence is within the existing vegetation and is therefore screened from view.

View No2: The section of the proposed fence at a distance of 880 m would be seen as an extension of the existing fence. One section of the proposed fence would be screened by the woodland as it grows and matures. As the existing fence does not appear as an outstanding element within the landscape, it is considered that the proposed fence would not add to any visual intrusion. The same applies to the proposed FCS fence. As the view to the north through the Inversnaid Glen is screened by the topography, only some parts of the proposed planting would become visible above the landform. The planting would be seen as a natural feature of the glen's landscape character.

Mitigation of landscape effect:

Due to the low effect, no mitigation is required from this viewpoint.

Significance of Visual Effects: Moderate – not significant

Viewpoint 6: Sheepfank

Figure Number: 7a and 7b

Viewpoint Location:

The viewpoint is located within the sheepfank, which is the final destination of the Nature Trail. View No 1 is aligned in a north-westerly direction. The viewpoint is situated on the east side of Inversnaid Glen 1 km to the south-east of the deer fence, at an elevation of 163 m AOD. View No 2 is aligned in a north-easterly direction. The viewpoint is situated 500m to the south-west of the deer fence.

Existing View:

View No 1: The view is an open panorama over Inversnaid Glen. The landform of Creag an Fhithichis forms the short distance skyline above Inversnaid Glen. The high peaks of Arrochar Alps rise above the landform of Creag an Fhithichis, forming the long distance skyline. The existing woodland planting is visible on the landform of Creag an Fhithichis in direct view.

View No 2: The view is enclosed by the landform of Stob an Fhainne which rises at a short distance and forms the skyline. In the foreground is the sheep fank and the middle ground is filled by burnside vegetation. (A large number of streams flow down from Stob an Fhainne to Snaid Burn at the bottom of Inversnaid Glen.)

Description of Effect:

View No 1: The view is an open panorama over Inversnaid Glen. According to the wireline, the proposed fence would not become visible within the Glen. The proposed planting would be seen between the existing planting and the sheep fank, extending along the foothill of Stob an Fhainne.

View No 2: The wireline shows a limited section of the proposed fence and the proposed planting spreading over the landform of Stob an Fhainne. As the trees start to grow the outline of the proposed fence will be further hidden behind the proposed planting.

Cumulative effect with FCS Fence: none

Importance of view: High due to the large numbers of visitors.

Landscape Sensitivity: High due to national level designations.

Magnitude and duration: Negligible/Low

View No 1: The proposed fence would not become visible within the Glen. Over a long period of time the proposed planting will close the view to the north-west. However the main views of scenic value are orientated through the Glen to the south-west and will not be screened by the proposed planting.

View No 2: The proposed fence line would be screened by the existing and proposed vegetation. Over a long period of time the proposed planting will close the view to the north-east. Only the peak of Stob an Fhainne would be seen above the woodland. However the main views of scenic value are orientated through the Glen to the south-west and will not be screened by the proposed planting.

Mitigation of landscape effect:

Due to the negligible/low effect, no mitigation is required from this viewpoint.

Significance of Visual Effects: Minor – not significant

Viewpoint 7: On Minor Road adjacent to Bistro

Figure Number: 8

Viewpoint Location:

The viewpoint is located on the minor road 30 m to the south-west of Inversnaid Bunkhouse Bistro. The view is aligned in a north-westerly direction. The viewpoint is situated 1.5 km to the south-east of the deer fence at an elevation of 109 m AOD. The closest point to the fence is just 20m to the south-west within the roadside vegetation.

Existing View:

The roadside vegetation creates an enclosure for the view. The Bunkhouse building is seen in direct view and the landmass of Stob an Fhainne risies above it, forming the skyline.
Description of Effect: The wireline shows the proposed fence line on the foothills of Stob an Fhainne and Beinn a Choin above Inversnaid Glen. A part of the proposed planting is shown above the Bistro building on the foothill of Stob an Fhainne. **Cumulative effect with FCS Fence:** The wireline shows a short section of the proposed FCS fence on Stob an Fhainne.
Importance of view: Medium View is experienced by walkers/travellers on the road. The section of the road between Inversnaid and Loch Lomond is lined by dense vegetation.
Landscape Sensitivity: High due to national level designations.
Magnitude: Negligible Due to the distance and existing vegetation the proposed fence line would not be visible. The same applies to the proposed FCS fence. The visible part of the proposed planting on the foothill of Stob na Fhainne would be seen as a natural feature of this landscape character.
Mitigation of landscape effect: Due to the negligible effect, no mitigation is required from this viewpoint.
Significance of Visual Effects: Minor – not significant

Due to the distance of the proposed fence line and planting, they would not be visible from the picnic area at Inveruglus Visitor Centre or The Loch Lomond Holiday Park at Inveruglas on the opposite banks of the Loch Lomond. The negligible magnitude of change identified on Viewpoint 1, indicates that no change in views would be experienced from the A82.

Residents of Garrison Farm and the other properties of Inversnaid would gain views of the proposed fence to the south-west, on the rocky landform of Sroin Uaidh, at a distance of 500m. Due to the existing vegetation, the proposed fence would not be apparent from the setting of these properties. The view of the proposed fence, which would be in place for a period of 15 to 20 years, is considered to be of low magnitude within the wider landscape which presently accommodates man-made structures. The growing woodland will also soften the view of the deer fence.

Views from the minor road through Glen Arklet of the proposed FCS fence which will run on both sides of Glen Arklet would be difficult to achieve due to the distance and the elevated position of the fence. Overall the road is lined by vegetation which screens most views of the proposed fence.

It would not be possible to achieve views of the proposed planting or proposed deer fence from the West Highland Way (WHW), the Woodland Nature trail, which runs close to the WHW would not experience any change in views. Much of the deer fence would not be visible from the Upland trail because of the landform and vegetation. The minor road which runs through Glen Arklet is designated as a Core Path. It is considered above that due to the existing vegetation which lines the road that views would not be affected by the proposed fence. Both The North Arklet and The South Arklet proposed FCS fences are too far from the road (beyond 1 km) to be visible.

According to the Loch Lomond and Trossachs Landscape Character Assessment (LCA) natural regeneration supplemented by new planting is common good practice in order to add visual diversity and structure to the scenery of open landscapes. It is noted that, *extensive woodland cover can conflict with local landscape diversity by leading to loss of open landscape scenic characteristics, and may damage the remains and obscure the setting of cultural heritage features.* Certainly the proposed woodland and regeneration area would not lead to the loss of open landscape scenic characteristics; on the contrary this planting will add texture to the Inversnaid Glen open moorland. Main views of scenic value are orientated through the Glen to the south-west. It is proposed that the upper woodland edges will be designed in such a way that an abrupt hard edge is not created but instead one that would naturally occur at those altitudes.

The Joint Agency Statement on Deer Fencing was published in June 2004 and represents policy collaboration between the Deer Commission Scotland, Scottish Natural Heritage, Forestry Commission Scotland and the Scottish Government.

According to the findings of this study the proposed deer fence would not cause any high impact issues, as defined by the Joint Agency Statement. Specifically it:

- will not detract from the visual quality of the countryside;
- will not run parallel to roadsides and recreational routes;
- will not impact on skylines;
- will not detract from the sense of wilderness;
- will not impact on designed landscapes or the landscape setting of individual features;
- will not become visible from major roads, popular hills, popular low level walks.

Overall, the landscape and visual assessment's conclusion is that the proposed deer fence and woodland would not result in any significant landscape and visual effects. Furthermore, the structure would only be temporary and removed once the new planting is established.

4. 3 Natural Heritage

The bird species that might be impacted by the afforestation proposal were determined by reference to Annex 1 of the Birds Directive, Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), UK Biodiversity Action Plan (UKBAP) priorities and Red and Amber listed Birds of Conservation Concern, and these can be termed priority species. Golden eagle and black grouse were highlighted for assessment, together with moorland breeding birds.

An otter survey was requested because of their European Protected Species status and a National Vegetation Classification survey was requested to map all the vegetation communities found within the project area. This would identify any open ground priority habitats.

4.3.1 Golden Eagles

4.3.1.1 Potential Impacts

Golden eagles are highly protected, they are Annex 1, Schedule 1, UKBAP and Amber listed species. There are about 440 breeding pairs in Scotland. They prefer open upland habitats dominated by heather and rough grassland in which to hunt and planting trees at high

densities reduces the area in which they can find prey. Eagle ranges and breeding success is determined by available prey and carrion, with sheep and deer forming a large part of their carrion diet, whilst grouse species and mountain hare are likely to be their most important live prey species. It is therefore important to assess how woodland proposals in their core ranges may affect the area in which they can hunt and the prey species associated with them.

4.3.1.2 Baseline information

There are three golden eagle territories in the vicinity of RSPB Scotland's Inversnaid nature reserve. One of these has been vacant for a number of years but has the potential to be an active territory sometime in the future. For completeness this territory has been included in the assessment process. Golden eagles are occasionally seen foraging over the reserve with birds occurring most often over Stob an Fhàinne and the ridge running north to south from Creag an Fhithich is also used.

4.3.1.3 Assessment and Mitigation of Impacts

An assessment of the impacts the proposals would have on eagles was carried out in accordance with the joint FC/RSPB Research Information Note No 292 Golden Eagles and Forestry. The golden eagle range centres were calculated and then buffered to 3km to determine each pairs' core area. The territory boundaries were then estimated between the neighbouring eagles. This information is displayed in a confidential annex to the ES. This shows that the proposals at Inversnaid are all outwith the core areas of the golden eagles (i.e where the eagles spend more than 50% of their time) but is on the edges of their territories.

The cumulative impacts of the proposal at Inversnaid with the woodland creation by FCS on the Loch Katrine Estate were also considered. The two active golden eagle territories in the above assessment are also the only two territories found within or near this area. FCS undertook a similar assessment during their EIA for the woodland creation project on the Loch Katrine Estate. The FCS woodland planting is within the outer part of the eagle's core areas. The core areas have very little existing woodland cover within them. The woodland in these areas will be established at very low densities and on the lower ground, which is less favoured by eagles. FCS concluded that with good woodland design they could probably have a positive impact by increasing prey species and number. Therefore, it is unlikely any negative cumulative impacts would occur from these proposals.

On the basis of the findings, which are that the project area is outside the main foraging area and are on the edges of the three eagle territories in the region; that there is little evidence the planting area contains a reasonable density or distribution of prey based on our knowledge of the moorland and the current lack of regular sightings of eagles hunting and the proposals are not of a scale that would create barriers to hunting or generate poor soaring conditions, it can be concluded it is unlikely there will be any significant impact to golden eagles as a result of this proposal. The woodland design may enhance prey availability because it will be planted with native species, have a large amount of open space, the edges will be sparsely planted and the regeneration area will change slowly to woodland.

4.3.2 Black Grouse

Black grouse is a red listed species of conservation concern, a UKBAP and has its own work programme within the National Park Biodiversity Action Plan. It is a priority species for RSPB Scotland at Inversnaid nature reserve and determines much of the management of the moorland and in-bye areas of the reserve. The woodland creation project is partly driven by the needs of this species and our aim to increase numbers of black grouse on the reserve. Black grouse are generally associated with woodland/moorland edges, which provide all of their requirements of food, shelter, nesting and chick rearing habitats.

4.3.2.1 Potential Impacts

Research has highlighted fence collisions as a potential major source of mortality for black grouse. The impacts of erecting a large amount of deer fencing at Inversnaid and therefore significantly increasing the risk of collisions of black grouse requires assessment, as it could affect the black grouse population found on and adjacent to the reserve.

4.3.2.2 Baseline information

Information on leks at Inversnaid is available from reserve records going back to the 1980s. Black grouse are monitored annually, by counting males at leks and for the past two years brood counts have also been carried out in mid summer to measure productivity.

The birds lek on the inbye ground at the locations identified in Figure 8 and can be heard from the Garrison car park. Sometimes they can be all on one lek and sometimes they split and spread across all three. They have also been seen flying southwards from Garrison to the slopes, south of Loch Arklet and continuing to lek there. The moorland area is regularly checked for lekking birds but none have ever been recorded.

Year	No. of lekking males
2008	4
2009	6
2010	7
2011	8
2012	4

Table 4: Number of lekking black grouse on RSPB Scotland Inversnaid nature reserve over the past five years.

The brood counts which are carried out in mid summer using pointer dogs, recorded one greyhen and one juvenile in 2010 and three greyhens and no juveniles in 2011. The majority of anecdotal records for blackcock, greyhens and chicks are from further up the Glen and many are from within the exclosure for the woodland planted in 1998.

4.3.2.3 Assessment and Mitigation of impacts

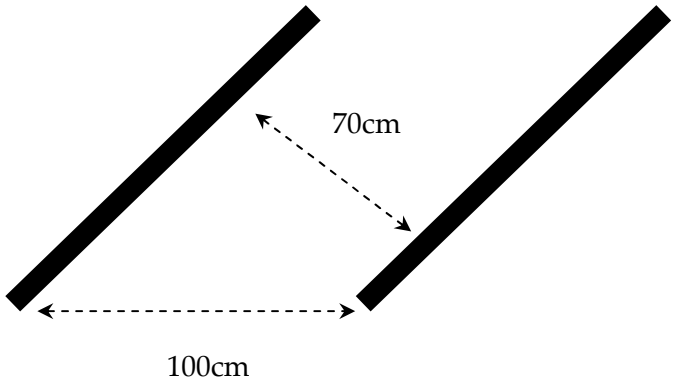
It has been proven that minimising the amount of deer fencing used, sensitively locating deer fences and increasing their visibility by marking them can significantly reduce the risk of collisions by black grouse. It is with these three elements in mind that the proposed line of the deer fence and associated marking has been chosen.

In addition, monitoring results collected for the existing fenced exclosure give reassurance there will be a negligible impact on black grouse as a result of the deer fence. The deer fence erected around the 25 ha Scots pine woodland in 1998 was marked and is regularly walked to find strikes and identify sections requiring maintenance. To date no black grouse collisions have been recorded on this fenceline. Black grouse are also regularly seen within the woodland.

Linking the fence with Forestry Commission's fence, will reduce the amount of fencing going through key black grouse habitats and the path of major flightlines. Two key sections are: across the southern edge of the proposed new woodland area with birds flying north to south within the Glen and secondly along the march with FCS, which has leks on either side of it. The fence will be off ridgelines and at the base of hills wherever possible.

Following the interim best Guidance Note produced jointly by Forestry Commission Forest Research and RSPB – Alternative deer fences in core capercaillie and black grouse habitats (August 2001) and from experience of advising on fence marking on other sites, we are proposing to mark all of the new deer fence.

The fence will be marked using single wooden droppers made ideally from larch. Each dropper will be about the size of roof tile batten, roughly 1200 x 30 x 12 mm or similar sizes produced on bulk scale by local mills. The droppers would be attached to the fence using galvanised potato sack ties and positioned diagonally on the fence one metre apart at the ends, see diagram below. This is the following the same design seen on the FCS Loch Katrine fences, as shown in the photograph below. To ensure the full lifespan of the fence can be realised where the fence is deemed to be in highly exposed areas it will be strengthened with additional angled stake braces and thrust posts.



A monitoring programme will be put in place for the fenceline to find strikes and identify sections that need repair. To further minimise the risk of collisions, three sides (1400 m) of the existing fence around the woodland exclosure will be removed because it will become redundant. Once the woodland has been established in 15 to 20 years, the whole deer fence will be removed.

As a result of the measures that will be taken to minimise the risk of collisions by black grouse as part of this proposal, there should be no significant impacts to the local black grouse population. It is hoped the proposals will have a positive affect on black grouse numbers on the reserve by delivering more woodland/moorland edges for the birds to use.

4.3.3 Moorland Breeding Birds (other than black grouse)

4.3.3.1 Potential impacts

Moorland breeding birds are associated with moorlands because they favour open upland habitats. Many of these species are UKBAP and Birds of Conservation Concern (Red and Amber listed). Planting trees in their upland habitats makes it less favourable to them over time and they may be lost as breeding birds from the planted area. This could affect their population status within the site.

4.3.3.2 Baseline information

An adapted Brown and Shepherd survey methodology (Gilbert, G., *et al*, 1998) was used to survey the project area, including a buffer zone. This involved recording all birds seen and heard during two early morning visits in good weather conditions; the first survey was completed in early May and the second visit was spread over two mornings with part of the site covered in late May, the rest in mid June. The results from both visits were analysed to determine probable breeding pairs, Figure 13 shows the locations of the territories recorded.

Species	Probable breeding pairs	Conservation Status	Impact
Black grouse	*Hen seen*	*Red list/UKBAP*	*Positive – increase in habitat*
Cuckoo	5	Red list/UKBAP	Negative – Host species will decline
Grasshopper warbler	3	Red list/UKBAP	Positive – increase in habitat
Lesser redpoll	1	Amber list/UKBAP	Positive – increase in habitat
Meadow pipit	49	Amber list	Negative – loss of habitat
Skylark	6	Red list/UKBAP	Negative – loss of habitat
Stonechat	1	Amber list	Negative – loss of habitat
Whinchat	4	Amber list	Negative – loss of habitat
Willow warbler	26	Amber list	Positive – increase in habitat

Table 5: Breeding territories and probable breeding of UK BAP and/or Red and Amber Listed Birds of Conservation Concern in the Project area.

4.3.3.3 Assessment and Mitigation of impacts

In total, eight priority species (excluding black grouse which was dealt with in the previous section), were recorded during the breeding bird surveys in the project area. Four are UKBAP species, three are Red listed and one is Amber listed. The other four species are all Amber listed. It is interesting to note that three of the UKBAP species are associated with woodland or woodland edges.

It is predicted the species that will be adversely affected by the proposal are cuckoo, skylark, meadow pipit, stonechat and whinchat. These species are found widely in the Scottish uplands. There are somewhere between 2100 – 4100 'pairs' of cuckoos in Scotland with the highest densities found in the north and west. Skylarks are common and widespread in Scotland and it features as a red list species because of the large declines it has experienced in England as a result of changes in agriculture. Meadow pipit is one of the commonest breeding passerines in Scotland with an estimated 1 to 1.6 million pairs. The Scottish whinchat population is somewhere between 15,000 and 20,000 pairs and the stonechat population is somewhere between 11,600 and 29,700 pairs (Forrester, R.W. *et al*, 2007).

It is proposed as part of this project to extend the area for cattle grazing into an area that has not been grazed by livestock for 10 years. The vegetation has become rank, similar to the

proposed planting area. Modestly grazing this area will create a mosaic of vegetation structure and therefore make it more attractive to a wider range of breeding moorland birds. The design of the woodland means there will continue to be a large amount of open space on its edges and within it. Likewise, the regeneration area is unlikely to be completely covered with trees. It is therefore likely in the short term that these areas will continue to be used by the moorland species and whinchat and stonechat may actually increase because young woodland can provide very favourable breeding habitat. In the medium to longer term, as the woodland develops, all these species are likely to disappear.

One of the aims of the project is to create woodland that is suitable for the suite of birds associated with Western Atlantic Oak Woodlands and which RSPB Scotland consider to be among the priority species that the Reserve is managed for. These are pied flycatcher, wood warbler and redstart. Other priority species likely to benefit from the woodland creation are tree pipit and spotted flycatcher.

Species	Conservation Status
Pied flycatcher	Red list
Wood warbler	Red list/UKBAP
Redstart	Amber list
Tree pipit	Red list/UKBAP
Spotted flycatcher	Red list/UKBAP

Table 6: Priority species likely to benefit from the woodland proposals as RSPB Inversnaid Reserve.

In the long term, one Red and three Amber listed species will be replaced by four Red and one Amber listed species. Therefore, it can be concluded that the project would have a positive impact by providing habitat for more of the highest priority species of conservation concern than the area currently does.

4.3.4 Otters

Otters are a European Protected Species and therefore a survey was required to identify otter shelters and to establish the presence or absence of otter on the site. An otter survey was carried out in May 2012 by a suitably qualified person. The length of the Snaid Burn and all the major tributaries were walked to identify any signs of otter on their banks, but no signs were discovered.

4.3.5 Vegetation

4.3.5.1 Potential Impact

Woodland creation could damage and cause the loss of priority open ground habitats. Vehicle movements across the site during the ground preparation and planting could damage sensitive habitats, especially blanket bog. Planting on blanket bogs causes them to dry out and prevent them from functioning as they should, which includes retaining water and storing carbon.

4.3.5.2 Baseline Information

Highland Ecology carried out a National Vegetation Classification (NVC) survey in 2003 over 440 ha of the reserve. RPS were commissioned to carry out a NVC survey in 2012 to supplement the earlier survey, as it did not cover all of the current proposed woodland

creation area. As there has been little change to the management of site since 2003, it was deemed unnecessary to repeat the NVC survey across the whole area. Where there was overlap between the two surveys for corroboration purposes, both surveys recorded the same communities and sub-communities throughout.

In total, 15 different communities are found within the 570 ha survey area, which can be further separated into 32 sub-communities. The communities range from typical acid upland communities including mire, wet and dry heath and acid grasslands, to woodland and flush communities surrounding watercourses and on the free draining soils of the steeper slopes.

Table 7 presents all the NVC communities recorded during the vegetation survey along with their current status with reference to the Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (the 'Habitats Directive') and the UK Biodiversity Action Plan, priority habitats list. An approximate total area is also provided for polygons where the NVC community is dominant. See Figure 14 for map showing these areas. The reports, map and accompanying target notes are presented in Appendix V.

NVC Code	Description	Annex 1 Biotype	UKBAP Priority Habitat	Approx. Area (Ha)
H10	*Calluna vulgaris-Erica cinerea* heath	European dry heaths	Upland heathland	26.4
H12	*Calluna vulgaris-Vaccinium myrtillus* heath,	European dry heaths	Upland heathland	11.4
M1	*Sphagnum denticulatum* bog pool community.	Blanket bogs	Blanket Bog	0.01
M6	*Carex echinata-Sphagnum fallax/denticulatum* mire,		Upland flush, fen & swamp	58.8
M15	*Trichophorum cespitosum - Erica tetralix* wet heath	Blanket bogs	Wet heath	54.2
M17	*Trichophorum germanicum-Eriophorum vaginatum* blanket mire	Blanket bogs	Blanket bog	51.0
M19	*Calluna vulgaris-Eriophorum vaginatum* blanket mire	Blanket bogs	Blanket bog	5.3
M20	*Eriophorum vaginatum* blanket mire	Blanket bogs	Blanket bog	0.01
M23	*Juncus effusus/acutiflorus-Galium palustre* rush pasture			12.5
M25	*Molinia caerulea-Potentilla erecta* mire	Blanket bogs	Blanket bog	8.7
U4	*Festuca ovina-Agrostis capillaris-*			42.6

NVC Code	Description	Annex 1 Biotype	UKBAP Priority Habitat	Approx. Area (Ha)
	Galium saxatile grassland			
U5	*Nardus stricta-Galium saxatile* grassland			85.2
U6	*Juncus squarrosus-Festuca ovina* grassland			24.9
U20	*Pteridium aquilinum-Galium saxatile* community			32.6
W17	*Quercus petraea – Betula pubescens – Dicranum majus* woodland	Woodland	Upland oak woodland	5.9

Table 7: Table of NVC communities recorded on site, their status and approximate area in which it is dominant.

4.3.5.3 Assessment and Mitigation of impacts

Within the site a number of the communities present are protected under European and UK legislation. Every effort will be made to maintain these areas in a favourable condition, or make steps to improve the conditions of these habitats if they are currently deemed to be poor.

The boundaries of the NVC communities will be used as a basis for the planting plan. There are often many different communities and sub-communities within a small area because of the topography of the site. When on the ground, planting areas must be interpreted flexibly in order to best match the tree species to the soil type. This will mean that the transition between different woodland communities will be diffuse rather than sharp.

The areas to be planted cover a variety of habitats e.g. U5 and U4 acid grassland, M6 acid flush, M15 wet heath and U20 bracken communities. Some planting areas will be close to areas of M17 blanket bog, which is a priority habitat, and planting should generally not take place in the vicinity of this community.

Possibly the most significant impact will be on the hydrology of the habitats based on waterlogged peats and peaty podzols. Due to the varied topography of the site and the associated variety of soils, it is difficult to map in detail all of the pockets of deep peat. Therefore, at the time of ground preparation and planting, vegetation that is likely to indicate deep peat will be highlighted to contractors, to ensure it is not disturbed or planted on. Most of the blanket bog identified from the NVC survey has been marked as open areas within the planting design plan.

Machinery will be required to carry out ground preparation in some parts. Care will be taken to ensure that there is minimal damage to fragile habitats from vehicles crossing the site. Key routes will be identified to help drivers avoid sensitive areas.

It is proposed to create native pine and birch/oak woods (see Table 3) which are priority habitats under the UKBAP. Caledonian Forest is a priority habitat under Annex 1 of the Habitats Directive. The planned expansion of these habitats at Inversnaid will contribute to the UK BAP and local targets set out under these BAPs.

The majority of the open hill and moorland presently supporting species poor acidic grassland will benefit from an increase in biodiversity. In addition, the ecological value of existing woodlands at Pollochro will be increased through closer linkage to woodland areas further to the east. New woodland planting next to established high value SSSI woods greatly increases the chance of these new woods being colonised by a ground flora typical of ancient woods and considered of high biodiversity/conservation value.

A number of the areas of mire in the north of the site are showing signs of degradation through pressure from the herbivore populations within the survey area. There are signs that trampling of vegetation in these areas is contributing to increased peatland erosion. Throughout the survey area, birch and rowan saplings are regenerating on areas of shallow peat, or on the steeper peat free slopes in the west of the survey area. It would currently appear that this process of natural regeneration is being hindered by a high browsing pressure from the herbivores within the area, with all saplings seen being no greater in height than that of the surrounding heath vegetation and all shoots appearing to have been browsed. Excluding herbivores from the area would improve the likelihood of natural regeneration occurring, and would similarly allow areas of damaged habitat the opportunity to recover.

In conclusion, with sensitive woodland design, micro-siting of trees, with no planting taking place on peat more than 50 cms deep in accordance with UK Forestry Standard, and mires and blanket bogs generally being retained as open space, the negative impacts on open ground habitats will be minimised. The woodland that will be established will be UKBAP priority habitat. It will improve the habitat connectivity eastwards from the Pollochro Woods SSSI and the remaining open ground habitats will be improved by the control of grazing pressure.

4.4 Archaeology

An archaeological survey was conducted by CFA Archaeology Ltd in 2003, who were commissioned by the RSPB Scotland following their purchase of Garrison Farm. The area surveyed at that time extended to around 817 hectares, encompassing all of the ground that is the subject of the EIA project area. As part of the scoping process for this project, West of Scotland Archaeology Service (WoSAS) was contacted. They concluded that as the previous survey was undertaken fairly recently (2003) by professional archaeology contractors, another survey would not be required.

4.4.1 Potential Impacts

Planted and regenerating trees and works associated with planting trees such as ground preparation and vehicle access could potentially damage archaeological features on the site.

4.4.2 Baseline information

WoSAS identified eight sites that appear to lie wholly or partially within the area likely to be affected by proposed planting. There are no sites identified within the natural regeneration area.

CFA Site Number	WoSAS Site Ref:	Feature
3	**65144**	Pollochro Burn – Shieling Hut
4	**65143**	Stob An Fhainne, Shieling Huts
5	**63401**	Bloomery mounds
14	**65538**	Sheepfold
24		Boundary feature
25		Fenceline
26	**65767**	Enclosure
29	**66279**	Snaid Burn – Shieling

Table 8: Identifies the eight features that to lie wholly or partially within the EIA project area.

A summary of the 2003 report relating to the above eight sites and map of their location can be found in Appendix V.

4.4.3 Assessment and Mitigation of impacts

The 2003 report has evaluated each feature, and has drawn up general management and monitoring recommendations. The report recommends that:

- Known archaeological sites should be avoided when planting new trees and a 20m buffer zone devoid of planted trees should be maintained to avoid damage from tree throw and root networks.
- The regeneration of natural vegetation should be monitored to ensure trees do not become established on known sites. All sites will be cleared of regeneration within a 20m zone.
- All vehicular access to the area should avoid known sites
- Monitoring of sites at periodic intervals to record changes in their condition.
- Ground-breaking works etc. may disturb buried remains of prehistoric date and consideration should be given to monitoring any such operations.

In recent correspondence, WoSAS made an additional suggestion:

- Sites 3, 4 and 29 - Shielings often occur in groups, and it is possible that additional examples may be present in the vicinity but were masked by vegetation during the time of the original survey. While the mapped structure lies just outside the area of proposed new woodland, WoSAS would advise that care should be taken to ensure that trees do not encroach onto it, and that it is not damaged by any movement of machinery in the vicinity.

Both the recommendations above and the Forestry Commission's "Forest and Historic Environment Guidelines" will be followed. Therefore, there will be no impact to the archaeological features found with in the planting area.

4.5 Social & Economic Impacts

As part of TGTF project, RSPB Scotland is considering building a small visitor centre/office in the Garrison Car Park. The interpretation on site will be improved and new technologies used to enhance the visitor experience. This will provide greater opportunities for visitors to engage and learn about the work of the RSPB and TGTF.

The Old Military Road path, supported by the local community, will be completed later in 2012 and this will form part of 'The Great Path', a Great Trossachs Forest initiative. A marketing strategy has been prepared for the Great Path and the partners are currently seeking funding to implement the actions from this strategy. It is hoped that there will be a moderate increase of visitors to the Reserve as a result.

4.5.1 Assessment of impacts

An increase in visitor numbers to the area should contribute to the local economy by people spending more time in the area and buying food, drinks and staying over at the various forms of accommodation available within a short distance of the reserve.

There are no proposed changes to the farming practices on the reserve. This is a critical part of the reserve management and the area of grazing is to be extended. Wherever possible, the Society uses local contractors to carry out its programme of major habitat management work.

Socio-economic impacts of the project on neighbouring stalking estates was discussed under the deer section earlier in this chapter.

In the long term, as a result of the woodland proposals, improved visitor facilities and access attracting more people to the Reserve, additional staff resource may be required to carry out land management, monitoring, wardening and visitor engagement roles.

Considering all the aspects of potential socio-economic impacts, it can be concluded there will be no negative impacts of the proposals on the local community. In time if or when the other visitor improvements take place as part of the overall development at the reserve, there is likely to be a positive impact.

4.6 Hydrology

There are two private water supply intakes at NN350 098 and NN 347 105, the former's catchment is outwith the proposed planting area and therefore will not be affected. However, the catchment area for the other intake burn (by the sheepfank) will be within the planting area. Part of the catchment of a third private supply for the Inversnaid Photography Centre lies within the regeneration area.

4.6.1 Potential Impacts

The ground preparation used to establish some of the trees within the catchment area of the water intake burn may cause increased siltation of the main burn and its tributaries. Fencing work through the catchment of the third water private water supply could also lead to siltation in the burn that provides this water supply. Both types of work could affect the water quality and colour.

Chemicals from the fertilisers and weed killers could get flushed into the water supply and affect water quality, taste and cause health problems. These all have the potential to be significant negative impacts.

4.6.2 Assessment and Mitigation of Impacts

The methods of ground preparation and establishment discussed in Chapter 3, will take into consideration this issue and the Forestry Commission's "Forests and Water Guidelines" will be followed and the terms of 10, 11 and 21 of the General Binding Rules (GBR) under Controlled Activities regulations (CAR) will be met. A method statement will be prepared, prior to works starting, to explain how silty water will be treated before it enters the water environment and agreed with SEPA. The above guidance and regulations will also be met to protect the water supply of the Inversnaid Photography Centre.

With assurances that legal responsibilities will be met, best practice guidance will be followed and contingency planning put in place, these should significantly reduce the potential for negative impacts on the water supply to residents and visitors that use this water. Therefore, the proposals should have minimal impacts.

4.7 Visitor & Public Access

In recent years a car park has been created behind the Garrison Farmhouse. An information board is located in the car park, along with seating and bicycle racks. Visitors are encouraged to walk up the glen to the sheep fank along the existing 800 m track; this is known as the Upland Trail. The formal access to the site terminates at the sheep fank. Visitors to the area are welcome to continue up the glen if they wish to proceed further.

There will be a new addition to the access network at Inversnaid when the Old Military Road path is completed later in 2012. This follows the old military road route from Stronaclachar and diverted into the Garrison Car Park. This new path will form part of 'The Great Path', a Great Trossachs Forest initiative.

4.7.1 Potential Impacts

Visitors may be deterred from walking further up the glen, onto the tops of the hills or beyond the reserve boundary because they would be concerned that they couldn't get through the deer fence. The developing woodland may also put people off because they perceive it to be difficult to walk through.

The aim is to have improved visitor facilities and interpretation together with the marketing of 'The Great Path' taking place during the same period as the woodland creation. As a result of this work there should be more people wishing to visit the new woodland area and learn more about it.

The community raised concerns that the proposed fence would exclude deer from areas that are easy to view them.

4.7.2 Baseline information

It is not known exactly how many people visit the Garrison Farm part of the RSPB Inversnaid reserve but a conservative estimate would be 250 per year. Out of those, perhaps only three quarters will walk to the sheepfank and only one or two percent will walk

beyond this point. This is confirmed by reserve staff who rarely see people beyond the sheepfank.

We are not aware of any known formal walking routes through the project area to the hills beyond, except one being mentioned in a walking book, which follows the march fence with FCS Loch Katrine Estate.

4.7.3 Assessment and Mitigation of impacts

It is well documented that the majority of people prefer to walk on desire lines and these already exist in the form of argocat routes mainly created by the stalker, which all run from the sheepfank to various points near the reserve boundary. These routes will not be planted on and will form part of the ongoing access and management within and through proposed planting area.

Where existing argocat routes pass through the proposed fenceline, a self closing gate will be installed to maintain access to the ground beyond the fence and will continue to allow the public access to the hills beyond. There will be some interpretation at the sheepfank and in the car park, which will state there are gates in the fence should visitors wish to continue to the area beyond the deer fence.

One of the aims of the project is to increase the number of people to the reserve and let them view more wildlife. This will be assisted if a new visitor centre is erected in the car park.

Therefore, based on the information known about numbers of people wishing to access the higher ground on the reserve, the woodland design incorporating desire lines and installing self-closing gates at appropriate points, the impacts on public access will be negligible.

4.8 Acidification

The location of the proposed new woodland falls within a critical load exceedance square. Following discussion with Forestry Commission and SEPA staff along with some catchment analysis, it has been concluded a catchment-based critical load assessment is not required.

5. Summary of impacts and mitigation

Issue/Subject	Potential Impact	Mitigation	Residual Impact	Permanence
Deer	The fence could increase the levels of browsing by deer within the Pollochro Woods SSSI and Craig Royston Woods SSSI. There could be a cumulative impact on deer numbers, densities, welfare and seasonal movement within the TGTF area as a result of existing, consented and proposed deer fences. Socio-economic impacts of increasing the number of deer culled on neighbouring Estates. Deer could be funnelled into private properties and the Inversnaid Hotel grounds.	Deer numbers will be kept fairly consistent at current levels. A Herbivore Management Plan for the whole reserve shall be written which will include details of monitoring methodologies to assess the browsing impacts within the Pollochro Woods SSSI. The results of these surveys will allow informed decisions to be taken about setting cull targets and adjusting them accordingly. Liaise with the partners of The Great Trossachs Forest and implement the strategic TGTF Deer Management Plan (DMP). Contribute to the new Balquhidder Deer Management Group DMP. Maintain dialogue with its members when setting cull targets. The deer fences shall be removed as soon as the new woodland is established.	There is unlikely to be any impacts on deer if all the mitigation is implemented. In the medium to long term the project will have a positive impact on the deer population once the deer fences are removed because there will be better habitat than currently exists.	Medium term
Landscape	The woodland does not fit into the landscape. The deer fences are visually intrusive in the landscape.	The woodland will be created with entirely native trees species, which will be matched to soil conditions and the landscape capabilies. The woodland will be planted to varying densities to replicate a natural woodland structure. As the trees start to grow they will break up the outline of	Minor or moderate impact from fenceline, depending on where the project area is viewed from. This is not considered to be significant when other	Short term to medium term

		fence and make it less visible. Overall, the landscape and visual assessment's conclusion is that the proposed deer fence would not result in any significant landscape and visual effects and therefore no mitigation is required. Fences will be removed once trees have been established.	manmade structures in the views are also included.	
Natural Heritage				
Golden eagle	Loss of foraging area within core eagle ranges	No mitigation is required because the project area is outwith the core area of all territories.	Minor loss of foraging area but with good woodland design the project could increase prey abundance. Neutral	Long term
Black grouse	Black grouse could fly into the new deer fences and be killed.	The fence will be located where possible off ridge lines, and at base of slopes. It will be marked to increase the visibility of the fence to black grouse. Planting with woodland species and designed to be favourable to black grouse	Overall the project will support a positive impact on the numbers black grouse found on the reserve.	Short to medium term
Moorland birds	Loss of moorland breeding birds	An area that was previously not grazed will now be brought under grazing management, which will benefit skylarks. The aim is to create habitat for four Red listed woodland species	Negative	Medium to Long term
Otters	None	None	None	None

Vegetation	Loss of or damage to priority open ground habitats.	By excluding deer from the area the likelihood of natural regeneration occurring will be greatly enhanced, and would similarly allow areas of damaged habitat the opportunity to recover. The NVC communities boundaries will be used as a basis for the planting plan. Micro-siting will be important to match trees to correct soil types. Areas of deep peat will be left as open ground. The areas to be planted cover a variety of habitats e.g. U5 and U4 acid grassland, M6 acid flush, M15 wet heath and U20 bracken communities. Some planting areas will be close to areas of M17 blanket bog, which is a priority habitat.	Whilst some habitats will be lost or reduced in size, overall there will be a positive impact on the biodiversity of the area through the creation of a priority habitat and improvement in the quality of retained areas of open ground habitat. The SSSI will become more robust as it becomes connected eastwards to new woodlands.	Long term
Archaeology	Trees could be planted or allowed to regenerate on the historical features causing damage to them. Vehicles used to do grounds works and tree planting could travel over the historical features, damaging them.	The woodland will be designed around the features which will include a 20m buffer zone. The sites will be mapped and avoided during tree establishment works. The general management and monitoring recommendations made by West of Scotland Archaeology Service will be followed as well as the Forestry Commission's "Forests and Archaeology Guidelines".	There will be no impacts Neutral	None
Hydrology	Planting proposals could affect the water quality of private water sources	Following an assessment of need, chemical weed control will be carried out around planted trees in accordance with product labels. In those areas where chemicals are not permitted, then hand cutting of vegetation around saplings will be carried out. It is not anticipated fertilisers will be required. However,	There will be no impacts Neutral	Short term

		there may be some instances where trees are showing signs of mineral deficiency. Fertiliser would then only be applied by hand and where permitted. The Forestry Commission's "Forests and Water Guidelines" will be followed and the terms of 10, 11 and 21 of the General Binding Rules (GBR) under Controlled Activities regulations (CAR) will be met. A method statement will be prepared, prior to works starting, to explain how silty water will be treated before it enters the water environment and sent to SEPA.		
Socio-Economic	Loss of jobs linked to changes of activity on the reserve.	There will be no changes to the grazing regime at the reserve and deer management will continue to be required.	Likely to be a positive impact in the medium term as improvements to visitor facilities and promotion of the reserve encourages more people to visit, buy refreshments or stay in the area thereby helping the local economy. As there is likely to be more land management, monitoring and people engagement work on reserve occurring, extra staff resource may be required. Positive	-
Visitor and Public Access	The appearance of the deer fence and trees may prevent people from exploring the	The existing argocat routes used for management activities mainly run from the sheepfank to various points near the reserve boundary. These routes shall not be planted on and	Neutral	Short to medium term.

	Snaid Glen and the hills beyond. The community raised concerns that the proposed fence would exclude deer from areas that are easy to view them.	will form part of the ongoing access and management within and through proposed planting area. Where existing argocat routes pass through the proposed fenceline, a self closing gate will be installed to maintain access for everyone. There will be some interpretation at the sheepfank and the car park, which will state there are gates in the fence should visitors wish to continue to the area beyond the deer fence. One of the aims of the project is to increase the number of people to the reserve and let them view more wildlife. This will be assisted if a new visitor centre is erected in the car park.		
Acidification	None	None	None	-

6. References

Forrester, R.W., Andrews, I, J., *et al*., 2007, The Birds of Scotland, The Scottish Ornithologists' Club, Aberlady.

Forestry Commission, 2001, Deer and Fencing, Forestry Commission Guidance Note 11.

Forestry Commission, 2009, Undertaking an Environmental Impact Assessment in Forestry and preparing an Environmental Statement, a Forestry Commission Practice Guide, Edinburgh.

Gilbert, G., *et al*, 1998, Bird Monitoring Methods, The RSPB, The Lodge, Sandy, Beds.

Trout, R., *et al*, 2001, Alternative deer fences in core capercaillie and black grouse habitats – An Interim Best Practice Guidance Note, jointly produced by The Forestry Commission Forest Research and The Royal Society for the Protection of Birds.

Land Use Consultants, Eamonn Wall and Co., URS Corporation, Small town & Rural development Group & The Natural Resource Consultancy, 2003, Loch Lomond & The Trossachs Local Woodland & Forestry Framework. Prepared for LL&TT National Park Authority, Forestry Commission Scotland & Scottish Natural Heritage.

McGrady, M.J. *et al.*, 1997, Golden Eagles and Forestry, Research Information Note 292, Issued by the Forestry Commission Research Agency in association with RSPB.

Rodwell, J. S. (ed.) 1991, British plant communities Volume 1-5, Cambridge University Press, Cambridge.

Rodwell, J. S. and Patterson, G. S., 1994, Creating New Native Woodlands, Forestry Commission Bulletin 112, HMSO, London.

SEPA, 2003, Loch Lomond Catchment Plan – Action Plan